

Rehabilitation of the Athletes' Village and 13 Training venues
for the 2030 Mediterranean Games in Kosovo

Environmental Programmatic Guidelines

DRAFT

August 2025



Identification of the document			
Title	Rehabilitation of the Athletes' Village and 13 Training venues for the 2030 Mediterranean Games in Kosovo		
	Environmental Programmatic Guidelines		
Versions	Indice	Date	Observation
	V1	01/08/2025	First version
	V2	21/08/2025	2nd version including Karine Frouin's comments
File name	KosovoMG2030_Environmental Program_V2		
Client	Agence Française de Développement (AFD)		
Contract	Marché EGI-2023-0251 notifié le 16/08/2023		
AFD Contact	Karine FROUIN / frouink@afd.fr Mélanie Malinvaud / malinvaudm@afd.fr Juliette JESTIN / jestinj.ext@afd.fr		
Rédacteurs	Margot Vast : margot@assemblage.net Chaïma Sghaier : chaima@assemblage.net Clément Davy : clement@assemblage.net		

SUMMARY TABLE

1. Introduction.....5

2. Methodology.....8

3. Architectural program.....13

4. Summary of EE recommendations.....23

5. Student center : Technical assessment, Audit Results & EE measures.....30

 Dormitory TYPE 1

 Dormitory TYPE 2

 Dormitory TYPE 3

 Dormitory TYPE 4

 Restaurant

 Tetori Sports Hall

6. Training venues : Technical assessment, Audit Results & EE measures.....67

 Elena Gjika

 Emin Duraku

 Faik Konica

 Hasan Pristina

 Iliria

 Ismail Qemali

 Nazim Gafurri

 Pavarësia

 Shkolla e gjelbër

 Qamil Batalli

 Xhemail Mustafa

 Don Bosko

 FEFS Sports hall

A large, dark blue triangle pointing to the right, occupying the left half of the slide.

1

INTRODUCTION

2030 Mediterranean Games

In September 2023, Kosovo was officially designated as the host country for the 2030 Mediterranean Games.

The Mediterranean Games will be the most important international event hosted in Kosovo and the challenge is to make this event an **international showcase with eco-responsible Games**. It is also an urban renewal and social project, a driving force for the region’s attractiveness and inclusive development, with a strong social, environmental and economic value-added dimension.

To meet the challenges associated with this project, the **Ministry of Culture, Youth and Sports** (MCYS) has requested the **French Development Agency (AFD)** (i) to provide technical assistance to support the preparation of the organization of the event and (ii) to finance necessary investments for the Mediterranean Games’, specifically for the Athletes village’ and ‘Training venues’.

Targeted infrastructure

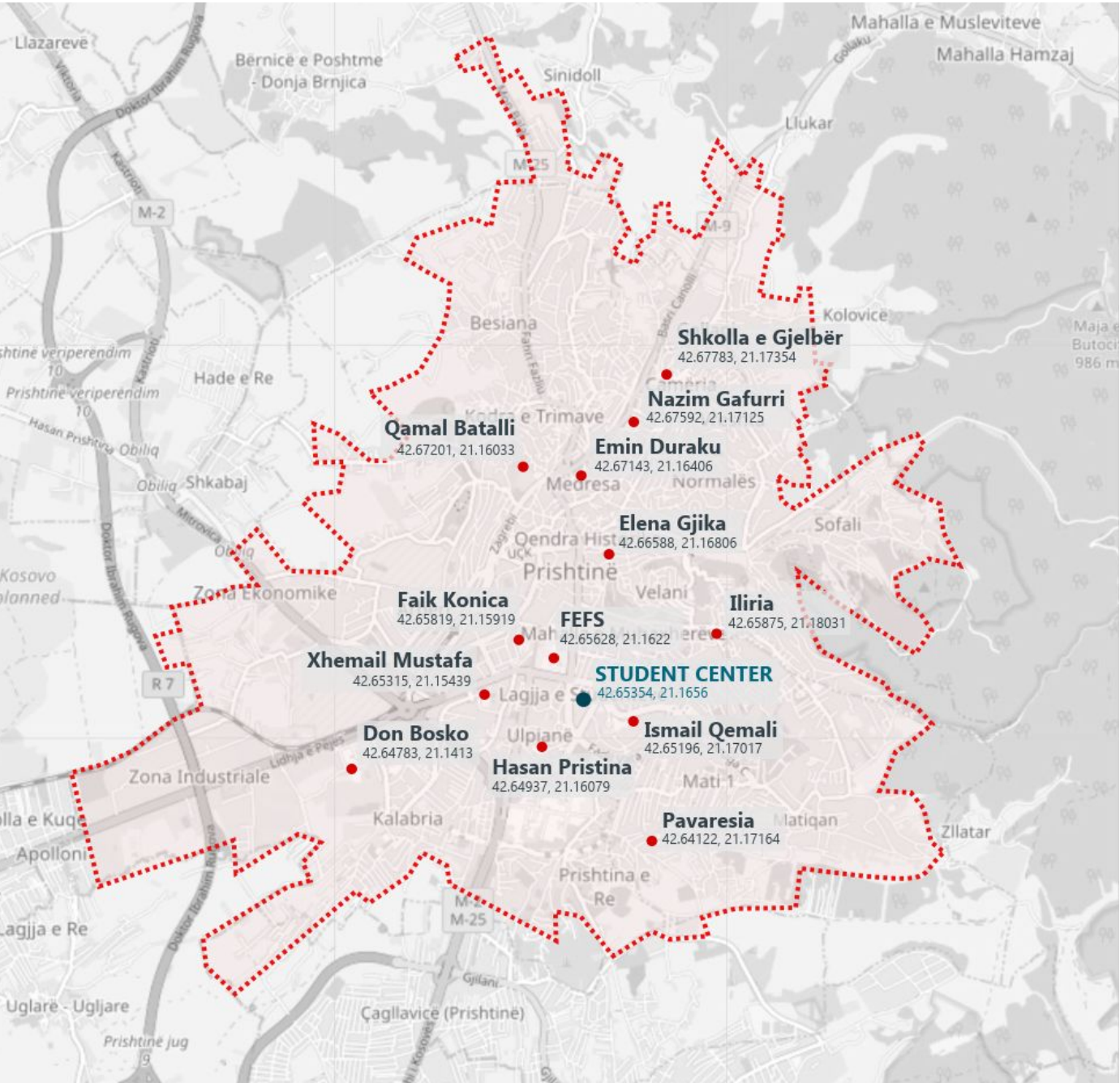
The buildings that will be part of the project financed by AFD are the following :

Athletes’ Village	The University of Pristina’s Student Center will be transformed temporarily into the Athletes’ Village.
13 Training venues	<p>One (1) of the training venues will be located in the Sports Hall building of the Faculty of Physical Education and Sports of the University of Pristina : FEFS sports hall</p> <p>Twelve (12) other training venues will be located in 12 Primary and Lower Secondary Education Physical Halls across the city of Pristina :</p> <ul style="list-style-type: none">- Elena Gjika- Emin Duraku- Faik Konica- Hasan Prishtina- Iliria- Ismail Qemali- Nazim Gafurri- Pavarësia- Shkolla e gjelbër- Qamil Batalli- Xhemail Mustafa- Don Bosko

The project can be divided into **two (2) subprojects** :

- **The Athletes’ village project**
- **The Training venues project**

Project location map - Pristina



The project includes both rehabilitation and new construction works to support the hosting of the Mediterranean games in Pristina. It involves the transformation and extension of the Student center into an Athletes’ Village for the time of the games, as well as the rehabilitation of 13 training venues, all located within the city of Pristina (see map below). Given its scale, this urban-level project will require strong coordination among stakeholders.

Architectural Program and Guidelines

An Architectural program and design guidelines prepared by the consultant Groupe 8 (refer to Annex 1) was conducted. This Program defines the project’s architectural scope, including elements such as demolitions, new construction and rehabilitation.

Project objectives

The development of sports and educational infrastructure within the framework of the Pristina MG 2030 project have a dual objective :

Short-term	To meet the functional and technical requirements of hosting a high-level international sport event.
Long-term	To ensure that investments lead to long-term enhancements for students, athletes, and the wider community.

To achieve this, the project is designed to deliver **modern, inclusive, and multifunctional facilities that will serve both the Mediterranean Games and the national education and sports systems well beyond 2030.**

Strategic Objectives

The project’s development is guided by the following key goals :

1. Improve and modernize existing infrastructure to comply with international standards for athlete accommodation and training.
2. Respond to the specific needs of schools and students, enhancing long-term usability and providing better learning and recreational environments.
3. Support the operations of local sports clubs and federations by adapting facilities to their needs, thereby promoting broader community engagement and sports participation.
4. Strengthen the city’s capacity to host future major events and reinforce Pristina’s visibility on the international stage.

Energy Efficiency

All infrastructures, whether to be renovated or built, must meet high standards of environmental sustainability, energy performance and accessibility.

The project specifically integrates :

- Ambitious energy efficiency targets, based on national norms and international best practices,
- Climate-resilient and sustainable design principles, including choice of materials and architectural approaches,
- Accessibility standards, ensuring inclusive access and use for all users.

By embedding Energy Efficiency and Environmental objectives into the infrastructure strategy, the project not only supports Kosovo’s low-carbon transition, but also contributes to the creation of resilient, high-performance public infrastructure. These investments are expected to **reduce the environmental footprint of public buildings while enhancing comfort, usability, and long-term service delivery for all beneficiaries.**

Environmental Program and Guidelines

The Architectural Program developed by Groupe 8 (Annex 1) is supplemented by this Environmental Program, which enhances the architectural approach with energy efficiency measures. These measures are based on energy audits carried out by a certified local consultant.

This document is divided into two main sections, corresponding to the two subprojects: the Athletes’ Village and the Training Venues.

It is structured as follows:

- Methodology
- Presentation of the architectural program
- Summary of EE recommendations
- For each building of both the Athletes’ Village and Training Venues subprojects:
 - Presentation of the building characteristics
 - Presentation of the energy audits results and EE measures

A large, dark blue triangle pointing to the right, occupying the left half of the slide.

2

METHODOLOGY

Objective of the Walkthrough Audits

The walkthrough audits conducted as part of this feasibility phase aim to provide a rapid and pragmatic assessment of the current condition and operational performance of the existing buildings. These preliminary audits serve to:

- Identify major issues or areas of concern, such as outdated equipment, user discomfort, or visibly inefficient systems;
- Develop a general understanding of how the facility is used, its physical condition, and the types of energy systems in place;
- Prioritize buildings or areas that require further detailed analysis or intervention;
- Inform initial planning decisions related to budgeting, scope definition for future energy audits, and retrofit strategies.

This type of audit is non-intrusive and primarily based on visual inspections, brief interviews with staff or users, and the review of any available data (e.g., utility bills, maintenance logs). It typically represents the first step in a broader energy audit and retrofit process.

While the walkthrough audit provides a preliminary estimate of energy consumption and associated greenhouse gas (GHG) emissions—both before and after the application of energy efficiency (EE) measures—it is important to note that actual energy use in the surveyed buildings often does not reflect standard comfort levels. In many cases, systems are malfunctioning or intentionally under-used (e.g. heating turned off to reduce electricity bills), making real consumption data an unreliable baseline.

For example, using the current consumption of an underheated sports facility would not accurately reflect its potential performance under standard thermal comfort conditions. Therefore, the approach adopted relies on **theoretical final energy demand**, calculated under the assumption that the building is operated in accordance with established comfort standards.

The aim is to identify and simulate improvement measures that enhance thermal performance while enabling adequate use of the buildings and reducing energy consumption and GHG emissions.

Audit Methodology

The methodology applied during the walkthrough audits included:

- A site visit focused on identifying opportunities for immediate operational and energy savings;
- An evaluation—where possible—of available energy consumption data over time, although in this case, historical electricity bills were largely unavailable;
- A visual assessment of the condition of the building envelope (walls, windows, roofs), technical systems (heating, ventilation, lighting), and any energy management systems (e.g., central steering or automation).

To define the baseline scenario, the existing condition of the envelope and systems was modeled to calculate the **theoretical energy needs required to meet standardized comfort conditions**. A second simulation was carried out using the improved configuration, with the energy efficiency measures applied, under the same comfort standards, to calculate the expected energy consumption and GHG emissions in the optimized scenario.

The audit takes place in 4 main stages, detailed as follows:

1	COLLECTING DATA			
1.1 Basic data	1.2 Architectural drawings	1.3 Construction methods	1.4 Invoices	
- Name, address, area, number of floors, year of construction - Use of the building, planning of occupation, number of occupants - Technical data sheets for systems and materials if any	- Level drawings : for each floor - Sectional drawings - Façades drawing	- Construction materials (for walls, roofs, floors) - Windows type (material and glazing) - Any renovation informations	Monthly or yearly invoices for : - Electricity - Gaz - Other energy source used for heating - Water	
2	ON-SITE INSPECTION			
2.1 Collecting missing data	2.2 General envelope condition assessment	2.3 Assessment of general systems conditions	2.4 Users feedback	
- Basic data - Architectural drawings - Construction methods - Invoices	- Opaque envelope (Walls, floors, roofs) : construction materials, damage, etc. - Translucide envelope (Windows) : construction materials, damage, opening surface, etc.	- Heating system: type, condition, assumptions on the performance - Ventilation: existing or not, type (single flow, double flow), condition - Cooling: existing or not, type, condition - Lighting: LED or not - Equipment: if any equipment impacting on consumptions	- Comfort in summer and winter - Feelings and needs	
3	DATA ANALYSIS			
3.1 Building thermal	3.2 Energy efficiency measures	3.3 Building thermal performance AFTER EE measures		
- Calculating U for each part of the envelope (walls, roofs, windows...) - Calculation of needs (in kWh) to achieve user comfort conditions - Quantity of CO2 and associated financial cost	Enveloppe : - insulation - new windows Systems (if any) : New heating system, ventilation, cooling, LED, etc. Passive EE measures : - Fans - Outdoor sun protection Renewable energy production (installation of PV panels, etc.)	- Calculating U for each part of the envelope (walls, roofs, windows...) - Calculation of needs (in kWh) to achieve user comfort conditions - Quantity of CO2 and associated financial cost		
4	SUMMARY REPORT			
4.1 Description of the current state of the building	4.2 Energy efficiency measures	4.3 Consumptions (kWh/year), emissions (CO2/year) and cost (€/year)		
General description, comfort perceived by users Envelope (walls, roofs, floors, windows) : - State - Materials and calculated U Systems (heating, ventilation, cooling, lighting, etc.)	- Description of EE measures - Associated financial cost per measure	- Before EE measures - After EE measures - Reductions and gain - Return on investment		

Calculation methodology for heating needs

For the data analysis stage (3), the thermal transmittance coefficient (U-value) is calculated for each part of the buildings' envelope (walls, windows, roofs, floors...) with the following formula :

Thermal Transmittance coefficient U-value

$$U = 1 / (R_{si} + \sum (d_i / \lambda_i) + R_{se}) \text{ [W/m}^2\text{·K]}$$

Where:

- d_i : Thickness of each material layer (m)
- λ_i : Thermal conductivity of each material (W/m·K)
- R_{si} : Internal surface resistance (typical value: 0.13 m²·K/W)
- R_{se} : External surface resistance (typical value: 0.04 m²·K/W)

With this value for each part of the buildings' envelope multiplied by the surface area associated, we obtain thermal conductivity for each part of the envelope in W/K.
 Building heating needs (Q_Useful), due to heat losses, can be calculated using the following the following formula:

Estimation of Needs (Useful Energy) for heating

$$Q_{\text{useful}} = [\sum (U_i \times A_i) \times HDD \times h] / A \text{ [kWh/m}^2\text{·year]}$$

Where:

- U_i : U-value of each building element (W/m²·K)
- A_i : Area of each envelope element (m²)
- HDD: Heating Degree Days for the building's location (°C·days/year) (for Kosovo Ministry of Energy uses HDD=1852)
- A: Total heated floor area of the building (m²)
- h: hours per day

This calculation method is used by our local audit expert V-ing to estimate the consumption for heating before and after EE measures.

Element	Thermal transmittance U (W/m²K)
External Walls	0.3
Windows	1.6
External doors	1.6
Floor slab	0.5
Roof slab	0.3

The requirements for thermal insulation are based on the Regulation 04/18 of the Ministry of Environment and Spatial Planning of Kosovo for Minimum Requirements for the Energy Performance of the Building.

Based on their experience, they also made recommendations on the systems (heating, ventilation, lighting). These recommendations are not included in their consumption calculations.

Assemblage ingénierie methodology

To complement the findings of the walkthrough audits conducted by V-ING, a supplementary analysis was carried out using an internal Excel-based simulation tool developed by our team. This tool builds upon the same core calculation principles used by V-ING, while enabling a more detailed input of building-specific parameters and usage patterns to refine the estimation of energy needs and greenhouse gas emissions.

Unlike local walkthrough methodology, this internal model incorporates additional variables such as:

- Building characteristics: including air permeability
- Occupancy patterns: number of occupants, duration of daily occupancy, and number of operating days per year;
- System-related gains and losses: including internal heat gains from lighting and equipment, solar gains through glazing, and ventilation losses.

Furthermore, the tool accounts for energy use beyond heating and cooling, notably lighting, domestic hot water, other equipment and appliances.

This allows for a more complete estimation of final energy demand and associated GHG emissions under standardized comfort conditions.

The Excel tool is structured across multiple thematic tabs, including:

1. **General information:** building typology, climate data, occupancy assumptions, and indoor temperature setpoints;
2. **Energy data survey:** collection of utility bill data (for indicative purposes only, not used for core calculations);
3. **Envelope assessment:** documentation of the current state of the envelope, including materials, insulation levels, and surface areas;
4. **Heat loss calculation:** quantification of transmission losses through different building elements;
5. **Energy efficiency measures:** definition of retrofit interventions and simulation of their impact on energy demand;
6. **Summary output:** compilation of energy needs, end-use breakdowns, and GHG emission estimates.

The results presented in the environmental analysis are based on simulations conducted using this internal calculation tool. All assumptions concerning the building envelope, technical systems, and energy efficiency measures were aligned with those used in the V-ING walkthrough audits, ensuring methodological consistency across both approaches. However, the Assemblage Ingénierie methodology allows for a more detailed and accurate estimation of energy consumption and greenhouse gas (GHG) emissions reductions, thanks to the integration of additional parameters and refined calculations. Consequently, this methodology was adopted in the environmental program as the reference approach for quantifying the projected impacts of the energy efficiency measures implemented under the project.

Complete energy audits' methodology

Objective

The methodology of the complete audit is similar to the walkthrough audit but it goes more into details.

A complete audit is a comprehensive and detailed assessment that provides the basis for decision-making on major rehabilitation, energy upgrades, or system replacement. The objectives are:

- To quantify the building's current energy use, operational costs, and performance;
- To identify and analyze energy-saving and system improvement opportunities, including cost-benefit analysis;
- To provide detailed recommendations with technical specifications, investment estimates, payback periods, and expected performance gains;
- To form the technical and financial foundation for project implementation (e.g., for design, procurement, or financing).

This audit includes instrumentation, measurements, detailed calculations, and modeling, and often requires access to historical data, technical documentation, and stakeholder input.

As explained for the walkthrough audits' objective, it is proposed to work using theoretical final energy demand, comparing the current condition with an improved state. The objective is to improve the buildings' thermal performance, enabling their use under adequate and standardized comfort conditions, while minimizing energy consumption and GHG emissions. This methodology allows the calculation of cooling and heating needs.

Complete audit methodology

1. Data Collection and Field Research

- Collecting data:
 - Building plans, technical drawings, past audit reports
 - Utility bills (electricity, heating, water) over at least 12–24 months
 - Maintenance logs, operation manuals, occupancy patterns
 - Visual inspection of the building and its energy systems (heating, cooling, domestic water supply, lighting, and other equipment).
 - Measurement of the building's geometric characteristics (surface area, volume, building envelope).
 - Measurements and monitoring if possible (indoor temperature, humidity, lighting levels, air infiltration...)
 - Assessment of the condition of the envelope elements (walls, floors, roof, doors, and windows) and identification of any potential thermal loss points.

2. Analysis of the Current Condition

- Assessment of actual energy use, normalized by climate and occupancy, and comparison with benchmarks or standards. Analysis of historical bills for electricity, heating fuel, and water. Modeling of the average monthly consumption and identification of trends and peak consumption seasons.
- Use of geometric data, thermal properties, and climatic conditions to calculate Heating and cooling demand. Simulation or modeling, where necessary, to evaluate energy performance and test upgrade scenarios. Analysis of the heating, distribution, and control systems.
- Comparison of the calculated consumption with actual bills to verify the results.
 - Identification of anomalies or inefficiencies
 - oversized boilers,
 - simultaneous heating and cooling,
 - poor envelope insulation, thermal issues
 - outdated lighting
 - structural issues
 - electrical system
 - plumbing system
- Calculation of CO₂ emissions based on energy consumption.

3. Development of Energy Efficiency Improvement Measures

- List of energy conservation and technical improvement measures (EE measures):
 - Envelope (insulation, windows)
 - HVAC upgrades or system change (e.g. from fuel boiler to heat pump)
 - Lighting and electrical systems
 - Water-saving measures
 - Automation and control systems
 - Integration of co-benefits: comfort, safety, accessibility, maintenance savings
 - Estimated cost for each EE measure

4. Conclusions and Recommendations

- Summary of the total potential for energy savings and CO₂ emissions reduction.
- Recommendation of a detailed implementation plan, prioritized according to effectiveness and urgency.
- Preparation of a comprehensive final report including tables, graphs, and illustrative figures.

The complete audit report includes the following:

- Executive summary and building profile
- Detailed description of current conditions and identified inefficiencies
- Technical datasheets of proposed EE measures
- Energy balance and financial analysis
- Photos, measurements, and calculations
- Recommendations for next steps (design studies, EPC preparation, phasing)

New building methodology

Objective of the evaluation a energy efficiency for new buildings

The objective is to identify energy efficiency requirements for the new buildings to be constructed as part of the Pristina MG2030 project, using a standardized baseline for comparison.

To this end, the EDGE tool developed by the International Finance Corporation (IFC) was used. EDGE (Excellence in Design for Greater Efficiencies) provides a benchmarking methodology that defines a reference scenario—referred to as the “baseline”—which represents typical local construction practices and average resource consumption (energy, water, and materials) for a given building typology and climate zone.

EDGE Methodology

The EDGE baseline is defined by a set of default assumptions that reflect local norms and minimum code compliance in the country of implementation. It integrates:

- **Location-specific parameters:** local climatic conditions (based on EDGE climate zones), typical energy prices (electricity, gas), and user behaviour patterns;
- **Building typology:** occupancy, surface areas, equipment usage, and function (residential, commercial, etc.);
- **Standard technical assumptions:** typically include single-glazed windows, low-efficiency lighting and HVAC systems, and electric water heaters

These baseline assumptions are preset and cannot be modified, ensuring consistency and comparability across projects.

In the EDGE platform, energy-saving measures can be selected and adjusted through a user interface structured around major categories:

- Lighting
- Ventilation and cooling
- Hot water systems
- Thermal envelope (glazing, wall, roof insulation)
- Appliances (for residential typologies)

The performance of the designed building is then assessed by comparing its projected consumption to that of the baseline. The output is expressed as a percentage of energy reduction achieved by implementing the selected efficiency measures.

For the new dormitories and service buildings foreseen within the Athletes' Village (Student Centre), the EDGE tool was used to:

- Establish the baseline energy consumption scenario aligned with local conditions in Kosovo;
- Evaluate proposed energy efficiency measures, including improvements to insulation, window glazing, HVAC systems, lighting, and hot water production;
- Quantify the anticipated performance gains as a percentage reduction in energy demand compared to the baseline scenario.

A large, dark blue triangle pointing to the right, occupying the left half of the slide. It has a solid, dark blue fill and a sharp point on its right side.

3

Architectural Program basics

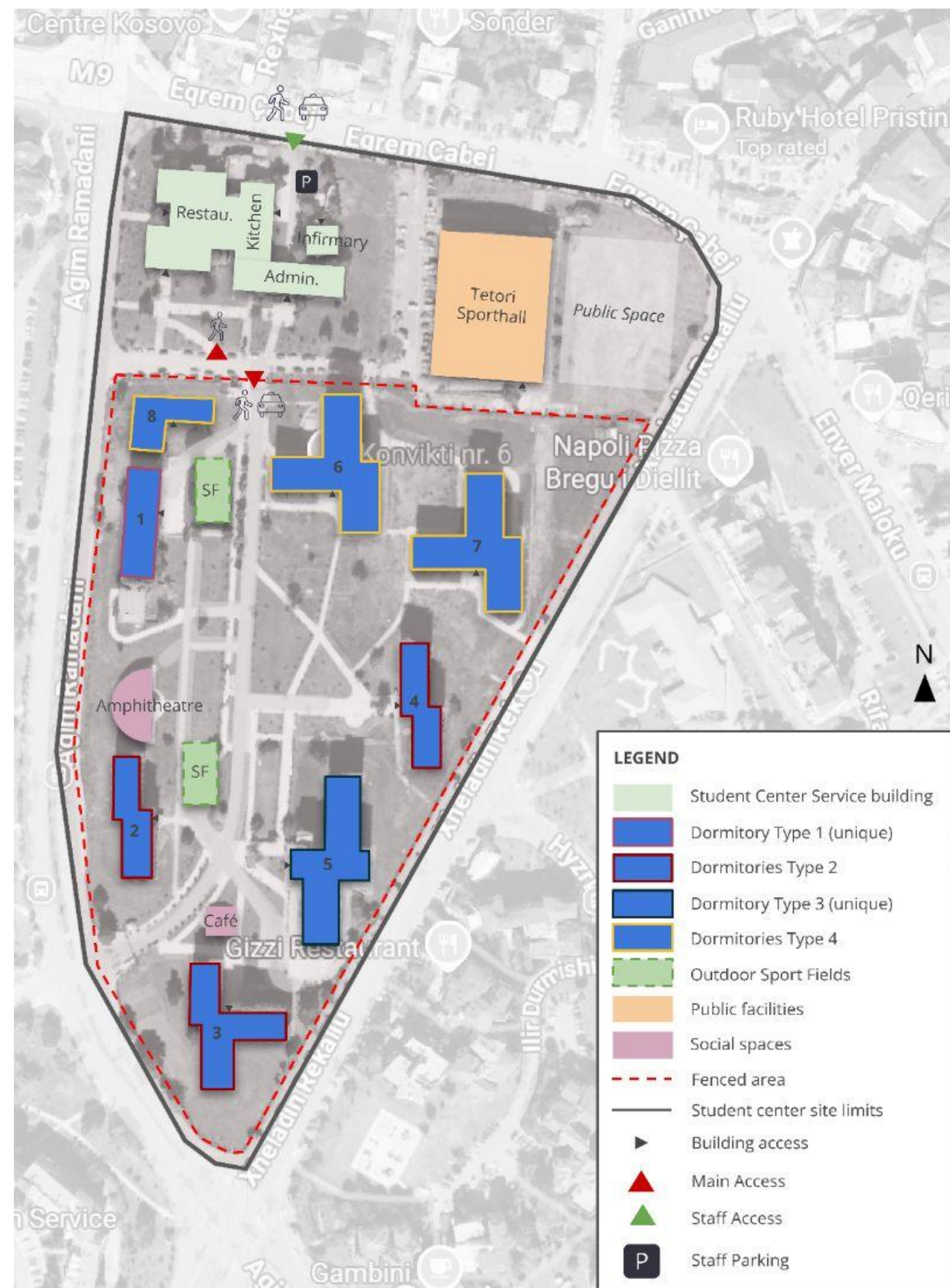
Student Center

The Student center of Pristina has around 15 buildings of different nature, including dormitories and other buildings for administration, restoration, and social areas (cafeteria, amphitheatre).

Some dormitories share similar construction types (refer to §Methodology). Therefore, **the dormitories have been classified by type depending on their construction method and the time they have been built** (see table). This classification facilitates analysis of the condition and the need for measures to be implemented.



Existing situation map



Planned renovations

The Student center will benefit from a combination of interventions, including **renovation, demolition and new construction**, designed to improve current conditions and transform the site into an Athletes’ Village for the MG2030.

The main interventions of the architectural project are presented below. For a detailed description of the architectural program and design guidelines, refer to Annex 1 : *Architectural Program and Guidelines for the Student Center and Athletes’ Village*.

All existing buildings that are not planned for demolition will be rehabilitated to meet targeted performance standards. The scope of renovation covers a broad range of improvements such as general upgrades, improvement of accessibility, electrical system renewal, energy efficiency measures and improvements in thermal comfort.

The most recent dormitory buildings, constructed relatively recently and already compliant with several standards, will not undergo full renovation.

In the table below, buildings undergoing **comprehensive non-structural renovation & systems replacement will undergo the following upgrades** : complete removal and replacement of all existing non-structural architectural elements and building services systems, both interior and exterior, including finishes, fixtures, fittings, and mechanical, electrical, and plumbing installations. The works exclude interventions affecting the load-bearing structure, foundations, or primary structural frame, except for minor repairs and interventions necessary to accommodate the new installations.

Intervention on Existing building		
Buildings	Construction types	Planned works
Dormitory 1	TYPE 1 (unique)	Comprehensive non-structural renovation & systems replacement
Dormitory 2	TYPE 2	
Dormitory 3	TYPE 2	
Dormitory 4	TYPE 2	
Dormitory 5	TYPE 3 (unique)	
Dormitory 6	TYPE 4	
Dormitory 7	TYPE 4	
Dormitory 8	TYPE 4	
Administration building	-	Demolition
Restaurant + Kitchen	-	Comprehensive non-structural renovation & systems replacement
Tetori Sports hall	-	Demolition
Health center	-	
Amphitheatre	-	

Planned new constructions

New constructions		
New buildings	Total area	Planned works
Three (3) 8 floor-dormitory buildings <ul style="list-style-type: none">- New Building #1 : 72 2-bed rooms and 122 single rooms- New Building #2 : 160 2 bed-rooms- New Building #3 : 320 2-bed rooms	18 273 sqm (NB #1 : 5417 sqm NB #2 : 4532 sqm NB #3 : 8324 sqm)	New construction
Student Plaza / Athletes village Plaza	925 sqm	New construction
Administration (2 levels) <ul style="list-style-type: none">- 25 offices minimum	410 sqm	New construction
Health center (2 levels)	955 sqm	New construction
Extension of the Kitchen & Restaurant	+1000 sqm	New construction
Commercial Gallery & Conference /Meeting rooms : <ul style="list-style-type: none">- Shops providing essentials and student-focused services- Versatile spaces available for rent or internal use	440 sqm	New construction
Commercial areas <ul style="list-style-type: none">- Café- ATM- Kiosks	130 sqm	New construction
Semi-Olympic Swimming Pool <ul style="list-style-type: none">- 8 lanes of 25m long	1300 sqm	New construction

Other interventions

The project also includes landscaping work and other temporary structures planned for the duration of the Games. These elements are not detailed here, as they do not require any environmental measures.

Programmatic Plan for the Student Center

The architectural interventions for the Student Center are presented in a Programmatic Plan, below.

Source : Architectural program and guidelines for the Student center and Athletes' village

Construction Typologies of Dormitories

Some dormitories **share similar construction characteristics and have therefore been grouped into categories** (Type 1, Type 2, etc.). However, certain buildings are unique in their design and construction, and thus are not categorized or form a unique typology.

Dormitories have been categorized based on the as-built drawings, using the following criteria :

- Type of construction materials : concrete or hollow brick
- Insulation thickness
- Year of construction

A total of **four construction typologies** have been identified for the dormitory buildings.



Programmatic Plan for the Athletes' Village

The main difference between the Programmatic Plan for the Student Center and the one for the Athletes' Village lies in the addition of temporary structures (T) for the time of the MG 2030. These include :

- Additional commercial areas
- Operational zones
- Change of functions of the library and working space
- Change of functions of the multi-purpose hall

Source : Architectural program and guidelines for the Student center and Athletes' village



Student center Architectural program - Estimation work costs

ESTIMATION WORK COSTS - STUDENT CENTER / ATHLETES' VILLAGE	
AREA	Estimated cost (VAT excluded)
Residencies	23 341 050€
Retrofitting of dorms	7 781 250€
Construction of new dorms	14 400 000€
Furnitures	1 159 800€
"Intra-muros" services	9 399 360€
Construction of new buildings	1 212 000€
Furnitures	77 360€
Landscape and outdoor areas	8 110 000€
"Extra-muros" services	3 682 740€
Restaurant	950 000€
Construction of new buildings	1 386 500€
Furnitures	226 240€
Landscape and outdoor areas	1 120 000€
Public services	2 870 000€
Tetori Sporthall	1 440 000€
Semi-Olympic swimming pool	1 430 000€
Temporary structures for the Village of Athletes	304 020€
TOTAL Works cost estimation	39 597 170€

This cost estimate is based on the study conducted by Groupe 8 as part of the Architectural Program and Guidelines.

This estimation will be complemented by energy efficiency measures that will generate additional construction costs.

Scope of the renovation

Groupe 8's program proposes the following renovation scope, which includes measures to improve energy performance and thermal comfort:

	D1	D2	D3	D4	D5	D6	D7	D8	Restaurant	Sporthall
General										
Installation of an elevator	X	X	X	X	X	X	X	X	X	-
Installation of ramp for disable person to access the building	X	X	X	X	X	-	-	-	-	-
Replacement of suspended ceiling in all bathrooms	X	X	-	X	-	-	-	-	-	-
Replacement of flooring (removing linoleum and installing vinyl since the origin and quality of existing linoleum is not known)	X	X	X	X	X	-	-	-	-	-
Installation of fire alarm system	X	X	X	X	X	-	-	-	X	-
Install Fire exit stairs	-	-	-	-	-	-	-	-	X	-
Electricity										
Detail assessment of the electrical installations	X	X	X	X	X	-	-	-	X	X
Replacement of the plugs and switches	X	X	X	X	X	-	-	-	-	-
Replacement of lights in the rooms.	X	X	X	X	X	-	-	-	-	-
Energy and Thermal confort										
Application of the thermal insulation on the ground floor slab	X	X	X	X	X	X	X	X	-	-
Application of the thermal insulation on the roof	-	-	-	-	X	-	-	-	-	X
Replacement of the diesel boiler for heating sanitary water	-	X	-	X	-	-	-	-	-	-
Installation of solar panels on the roof of the facility to meet the energy needs of the building.	-	-	-	-	-	-	-	-	X	X
Replacement of the radiators for more engaged efficiency which would result in more efficient heating energy	X	X	X	X	X	-	-	-	X	X
Detailed enery efficiency assessment and audit	-	-	-	-	-	-	-	-	X	X
Structure and seismic assessment										
Conducting a structural assessment to evaluate the building's seismic performance under the design earthquake, in accordance with current design codes.	X	X	X	X	X	X	X	-	X	-
Assessment of the floor slab above the basement and potentially design for strengthening.	X	X	-	X	-	-	-	-	-	-
Construction period	1967	1967	1969	1967	1989	2007	2007	2014		
Change of function of some rooms to reach standards										
Number of rooms to be converted into sanitary blocks	6	6	-	6	12	-	-	-		
Number of rooms to be turned into common areas	5	5	-	5	-	-	-	-		
Type of bathroom										
Shared for 2 bedrooms	-	-	X	-	-	X	X	X		
Shared for each wing	X	X	-	X	X	-	-	-		

As part of this Environmental Program, energy audits have been conducted to provide a more detailed assessment and to develop tailored EE measures.

Accordingly, **Groupe 8's recommendations regarding energy efficiency should not be considered applicable. The EE measures outlined in the current program take precedence and must be used as the reference for the project's implementation.**

Training venues

The thirteen (13) training venues to be renovated for the Games are located in :

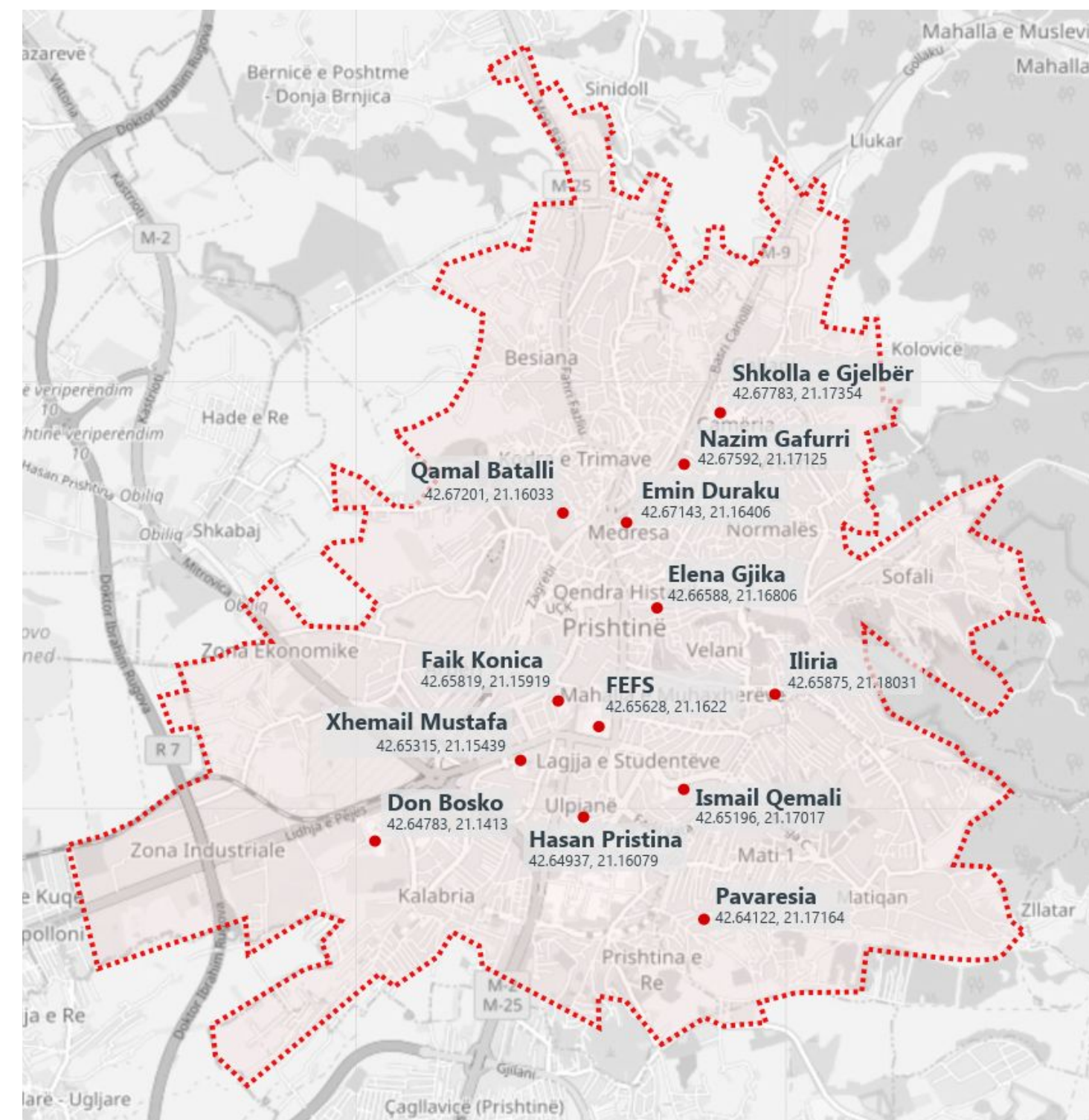
- University of Pristina sports hall : FEFS sports hall
- 12 Primary and Lower Secondary Schools' physical education halls

Below is the list of the 13 Physical Education halls covered by the project

Buildings	Gross Area	Year of construction
University of Pristina		
FEFS Sport hall	1 066 sqm	1975
Primary and Lower Secondary Schools' education physical halls		
Faik Konica	592	1968
Nazim Gafurri	574	2013
Emin Duraku	554	2013
Xhemail Mustafa	617	2004
Pavarësia	534	2016
Elena Gjika	379	1927
Hasan Pristina	710	1968
Iliria	514	
Ismail Qemali	692	1981
Shkolla e gjelbër	492	2011
Qamil Batalli	650	2013
Don Bosko*	-	2014

**No architectural drawings were available for Don Bosko, which prevented the completion of the Energy Audit. Once the drawings are provided, a revised version of the Environmental Program will be developed to include Don Bosko.*

Location of the Training venues



General conditions

Overall, the training venues are in good condition. The main issues are the bathrooms and changing rooms that need to be renovated and equipped.

Regarding the equipment and storage needs, it will depend on the type of sport, which is not yet determined.

Sports facilities are usually **separate from school buildings**, allowing direct access to the fields **without passing through the school**. This separation is beneficial for their use during the **Mediterranean Games**, allowing **temporary spaces** to be added for the event.

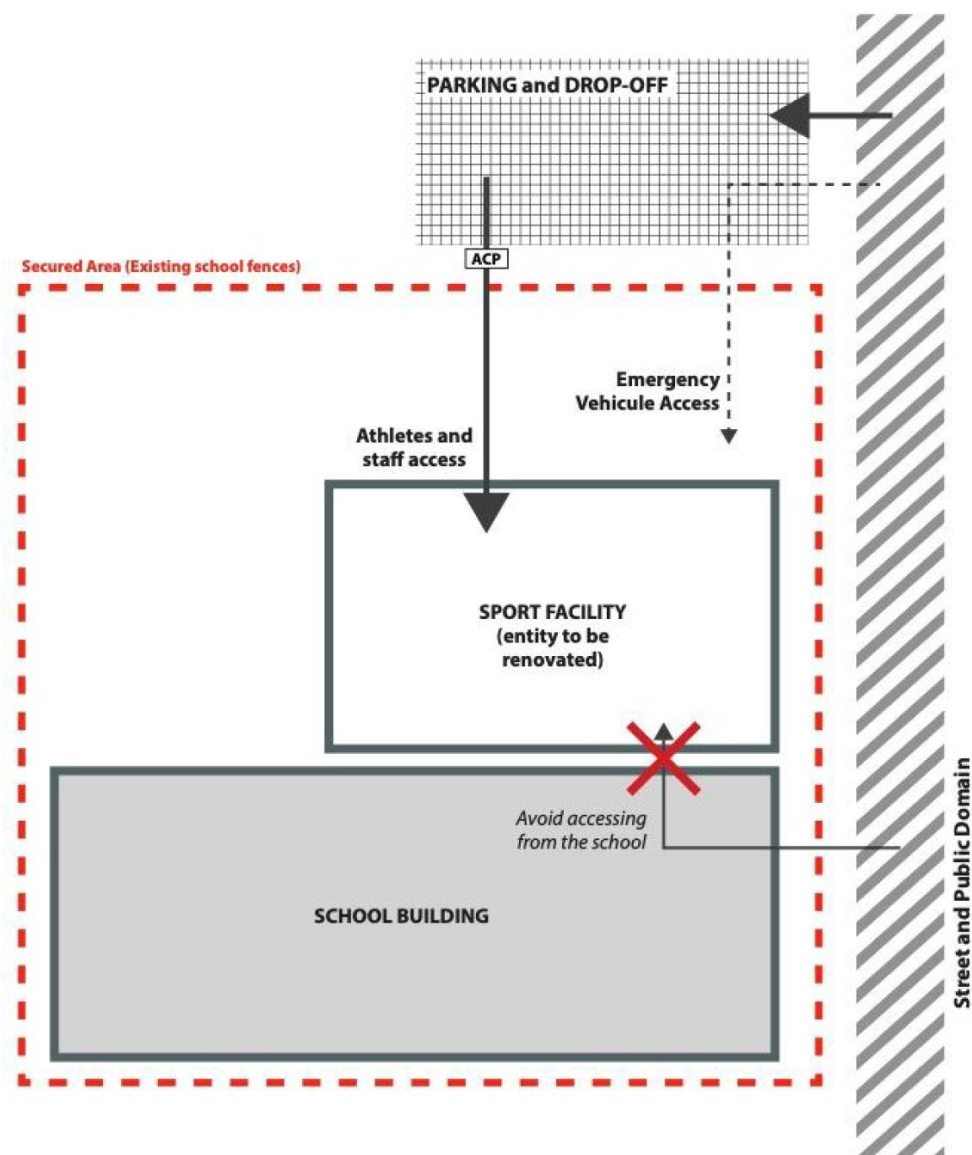
Access and Mobility Standards

Mobility

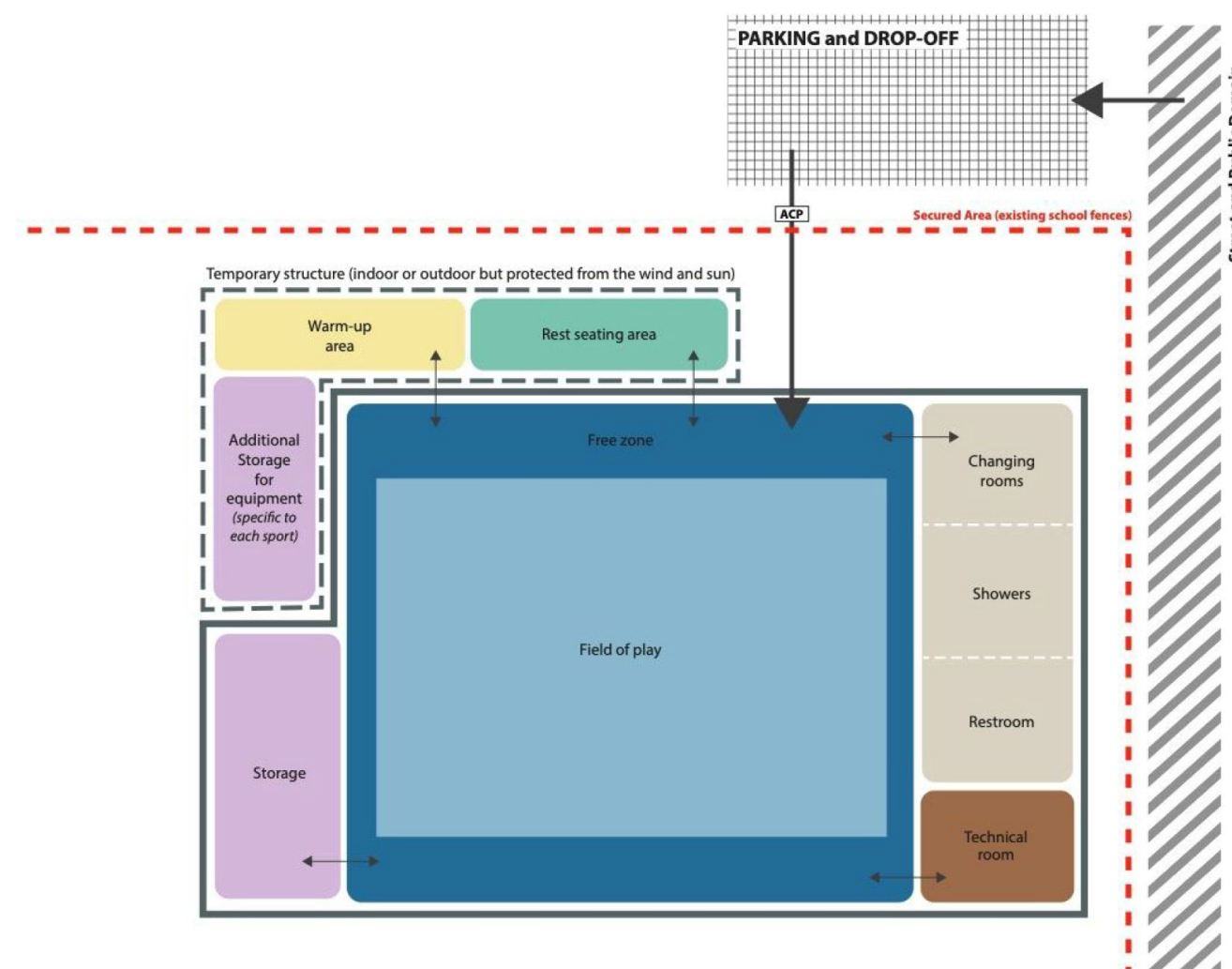
- Each venue should have designated shuttle/transport drop-off points and pedestrian access.
- Emergency vehicles must have access to the secure perimeter.

Access

- Access control and security surveillance are required at each entrance.
- Athletes must be allowed in 1 hour before training (based on MG schedule).
- Staff access may be available 24/7, depending on work shifts and event schedule.



Training Venues Operational Plan



Source : Architectural program and guidelines for the Training Venues

Training venues Architectural program - Estimation work costs

No.	Institution	Type	Total renovation cost (excluding VAT)
1	Primary and Lower Secondary Education Physical hall : Faik Konica	Public School	210 000€
2	Primary and Lower Secondary Education Physical hall : Xhemajil Mustafa	Public School	283 500€
3	Primary and Lower Secondary Education Physical hall : Elena Gjika	Public School	84 000€
4	Primary and Lower Secondary Education Physical hall : Emin Duraku	Public School	135 000€
5	Primary and Lower Secondary Education Physical hall : Qamil Batalli, Model	Public School	176 400€
6	Primary and Lower Secondary Education Physical hall : Nazim Gafurri	Public School	210 000€
7	Primary and Lower Secondary Education Physical hall : Ismail Qemali	Public School	270 000€
8	Primary and Lower Secondary Education Physical hall : Iliria	Public School	109 200€
9	Primary and Lower Secondary Education Physical hall : Hasan Pristina	Public School	93 600€
10	Primary and Lower Secondary Education Physical hall : Pavaresia	Public School	126 000€
11	Primary and Lower Secondary Education Physical hall : Green School	Public School	109 200€
12	Primary and Lower Secondary Education Physical hall : Don Bosko	Private School	144 000€
13	University of Pristina Sport Hall : FEFS sports hall	University	240 000€
N/A	Outdoor spaces (parking, drop off, additional pathways, etc.)	N/A	650 000€
TOTAL works cost estimation			2 840 900€
N/A	Equipments (10%)	N/A	284 090€
TOTAL Cost estimation			3 124 990€

This cost estimate is based on the study conducted by Groupe 8 as part of the Architectural Program and Guidelines.

This estimation will be complemented by energy efficiency measures that will generate additional construction costs.

Typologie of training venues

Only **one typology** of construction has been identified for training venues, which includes **five facilities** with similar characteristics. The remaining **eight venues** each have unique construction features and do not belong to any common typology.

For **training venues**, even though some seem to have similarities regarding architectural plan and year of construction, construction material and area are different. In the following analysis each training venue is treated independently.

A large, dark blue triangle pointing to the right, occupying the left half of the slide. It has a white number '4' inside it.

4

Summary of EE recommendations

Potential Energy Efficiency measures on the envelope - Student center

The student center buildings audits detailed below have led to the following possible recommendations for the building envelope :

- Improve **wall insulation**, from the outside (ETICS) if technically feasible.
Required $U=0,3 \text{ W/m}^2\cdot\text{K}$ for walls.
- Improve **roof insulation** and waterproofing (if required).
Required $U=0,3 \text{ W/m}^2\cdot\text{K}$ for roof.
- **Replacing windows and doors**, if existing elements are inefficient and in poor condition.
Required triple-glazing* windows argon-filled, low-e coating ($U=1,1 \text{ W/m}^2\cdot\text{K}$) with hygro-adjustable air inlet for ventilation.
** The small difference in cost between triple and double glazing will be offset by the energy savings. The carbon footprint of a triple-glazed window (1.5 x greater than double-glazed) will be offset by the savings in heating costs (as heat production tends to be carbon-based (oil or coal)).*
If savings are to be made on the project in the future, switching to double glazing, argon-filled, dual low-e coating ($U=1.6 \text{ W/m}^2\cdot\text{K}$) will reduce costs without having a major impact on the project's thermal performance.
- Improve **floor insulation**, where technically feasible.
Required $U=0,5 \text{ W/m}^2\cdot\text{K}$ for floor.

Passive EE measures for summer comfort:

- **Install exterior solar protection** (Shutters, solar shades...)
- **Paint the roof white** to increase the albedo (mainly for the SportsHall and Restaurant)

Potential Energy Efficiency measures with system - Student center

After the EE measures on the envelope, further system measures can be applied if required:

- **Installation of a mechanical ventilation system** for dormitories (in addition to existing CMV (Continuous mandatory ventilation) in damp rooms).
Single-flow mechanical extraction system, with an exhaust duct in each room where technically feasible. Alternatively, air exhaust may be located in the corridors. Windows should be fitted with humidity-sensitive air inlets, and doors should include an undercut to enable airflow from the window inlets when corridor exhaust is used.
- **Replace or improve heating systems**, if existing elements are inefficient and in poor condition.
Adding insulation on the heating pipes.
Replacing radiators if poorly performing or in poor condition.
Adding thermostatic radiator valves (TRVs).
Introduce Digital Control System.
- **Replace lighting systems to LED** where needed. Install Occupancy Sensors in common areas.
- **Replace Boilers** (for sanitary hot water) to new ones with more efficiency.
- **Adding new solar panel** for hot water or electricity

Measures for summer comfort:

- **Install fixed air fans**, where technically feasible.
- **Install air conditioning**, as a last resort to guarantee occupant comfort. (This recommendation will be refined when the complete audits are available)

During the design phase, measures for each building must take into account the use(s) that will be made of the buildings studied.

Priority should be given to envelope measures to reduce consumption and improve comfort, before active measures (measure on systems).

The Service Provider shall perform **dynamic thermal simulation** to model the efficiency of the various passive EE measures before including air-conditioning systems in the project. Dynamic thermal simulation are recommended for each type of building (restaurant, sports hall, each type of dormitory).

STUDENT CENTER

SUMMARY TABLE OF THE MAIN INTERVENTIONS FOR RENOVATIONS AND NEW CONSTRUCTION

		Konvikti 1	Konvikti 2	Konvikti 3	Konvikti 4	Konvikti 5	Konvikti 6	Konvikti 7	Konvikti 8	Restaurant	Tetori Sport hall
Envelope	Walls insulation (cm)	5cm	5cm	5cm	5cm	10cm					
	Roof insulation (cm)	12cm		12cm					8cm	10cm	10cm
	Floor insulation (cm)	10cm	10cm	10cm	10cm	10cm	10cm	10cm	10cm	10cm	10cm
	Windows renewing : Double Glazing (DG) or Triple Glazing (TG)	TG	TG	TG	TG	TG	TG	TG	TG	TG	
	Doors renewing : Double Glazing (DG) or Triple Glazing (TG)	DG	DG	DG	DG	DG	DG	DG	DG	DG	
	Exterior solar protection	x	x	x	x	x	x	x	x		x
Other measure		x	x	x	x	x	x	x	x	x	
Systems	Heating	Renovation and cleaning of the existing system	x	x	x	x	x	x	x	x	x
		Replacing the production unit									
		replacing radiators or unit heaters	x	x	x	x					
		Piping insulation	x	x	x	x	x	x	x	x	x
		adding Thermostatic radiator valves (TRV)	x	x	x	x	x	x	x		
		Introduce Digital Control System	x	x	x	x	x	x	x		
	Ventilation	Renovation and cleaning of the existing system								x	x
		Install simple-flow ventilation système	x	x	x	x	x	x	x		
		Install double-flow ventilation système with heat recovery									
	Lighting	Replace non-LED units to LED	x	x	x	x	x	x	x		
		Introduce daylight sensitive controls	x	x	x	x	x	x	x		x
		Introduce sensitive sensors	x	x	x	x	x	x	x		x
	Sanitary	Replace taps with sensor-activated taps, or self-closing taps, equipped with flow restrictors or aerators.	x	x	x	x	x	x	x	x	x
		Install low-flow showerheads (≤ 6–9 L/min), faucet aerators, and dual-flush or low-flush toilets (≤ 4/6 L per flush).	x	x	x	x	x	x	x	x	x
		Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	x	x	x	x	x	x	x	x	x
		Integrate water metering per zone to monitor and manage usage	x	x	x	x	x	x	x	x	
	Cooling	Install a cooling system and units (On hold until complete audits are delivered)									

Potential Energy Efficiency measures on the envelope - Training venues

The training venues audits detailed below have led to the following possible recommendations for the building envelope :

- Improve **wall insulation**, from the outside (ETICS) if technically feasible.
Required $U=0,3 \text{ W/m}^2\cdot\text{K}$ for walls.
- Improve **roof insulation** and waterproofing (if required).
Required $U=0,3 \text{ W/m}^2\cdot\text{K}$ for roof.
- **Replacing windows and doors**, if existing elements are inefficient and in poor condition.

Required triple-glazing*, argon-filled, dual low-e coating ($U=1,1 \text{ W/m}^2\cdot\text{K}$).

** The small difference in cost between triple and double glazing will be offset by the energy savings. The carbon footprint of a triple-glazed window (1.5 x greater than double-glazed) will be offset by the savings in heating costs (as heat production tends to be carbon-based (oil or coal)).*

If savings are to be made on the project in the future, switching to double glazing, argon-filled, dual low-e coating ($U=1.6 \text{ W/m}^2\cdot\text{K}$) will reduce costs without having a major impact on the project's thermal performance.

- **Windows shall be openable to enable cross ventilation**
- Improve **floor insulation**, where technically feasible.

Required $U=0,5 \text{ W/m}^2\cdot\text{K}$ for floor.

Passive EE measures for summer comfort:

- **Install exterior solar protection**
- **Paint the roof white**

Potential Energy Efficiency measures with system - Training venues

After the EE measures on the envelope, further system measures can be applied if required:

- **Installation of a mechanical ventilation system** (if non-existent or out of order).
Prefer a double-flow system with heat recovery, especially for areas with a high flow rate (vol/h) (training venues).
- **Replace or improve heating systems**, if existing elements are inefficient and in poor condition.
Adding insulation on the heating pipes.
Replacing radiators and unit heaters, if poorly performing or in poor condition.
Adding thermostatic radiator valves (TRVs).
- **Replace lighting systems to LED**. Introduce Daylight-Sensitive Controls and occupancy sensors.
- **Install solar panel** on the roof of the facility to meet the energy needs of the building.

Measure for summer comfort:

- **Install fixed air fans**, where technically feasible.
- Install temporary **air conditioning** unit during the MG2030 to guarantee athletes comfort.

During the design phase, measures for each building must take into account the use(s) that will be made of the buildings studied.

Priority should be given to envelope measures to reduce consumption and improve comfort, before active measures (measure on systems).

We recommend a study of the energy efficiency of the various passive measures via a **dynamic thermal simulation** before including an air-conditioning system in the project.

		TRAINING VENUES												
		SUMMARY TABLE OF THE MAIN INTERVENTIONS FOR RENOVATIONS AND NEW CONSTRUCTION												
		FEFS Sport Hall	Elena Gjika	Emin Duraku	Faik Konica	Hasan Pristina	Iliria	Ismail Qemali	Nazim Gafurri	Pavarësia	Gjelber	Qamil Batalli	Xhemail Mustafa	Don Bosko
Envelope	Walls insulation (cm)		10cm			10cm		8cm	5cm	5cm			5cm	
	Roof insulation (cm)	10cm	8cm	10cm	10cm	10cm	10cm	12cm	10cm	10cm	Renovation needed		10cm	
	Floor insulation (cm)	10cm	10cm	10cm	10cm	12cm	10cm	10cm	10cm	10cm			10cm	
	Windows renewing : Double Glazing (DG) or Triple Glazing (TG)	TG	TG	TG	TG	TG	TG	TG	TG	TG			TG	
	Doors renewing : Double Glazing (DG) or Triple Glazing (TG)	DG	DG	DG	DG	DG	DG	DG	DG	DG			DG	
	Exterior solar protection	x	x	x	x	x	x	x	x	x	x	x	x	
Other measure		Install fans		x	x	x	x	x	x	x	x	x	x	
Systems	Heating	Renovation and cleaning of the existing system	x	x	x	x	x	x	x	x	x	x	x	
		Replacing the production unit												
		replacing radiators or unit heaters	x	x	x	x	x	x	x	x				
		Piping insulation	x	x	x	x	x	x	x	x			x	
		adding Thermostatic radiator valves (TRV)							x				x	
		Introduce Digital Control System	x											
	Ventilation	Renovation and cleaning of the existing system									x	x		
		Install simple-flow ventilation système												
		Install double-flow ventilation système with heat recovery	x	x	x	x	x	x	x	x			x	
	Lighting	Replace non-LED units to LED	x	x	x	x	x	x	x	x	x	x	x	
		Introduce daylight sensitive controls	x	x	x	x	x	x	x	x	x	x	x	
		Introduce sensitive sensors	x	x	x	x	x	x	x	x	x	x	x	
	Sanitary	Replace taps with sensor-activated taps, or self-closing taps, equipped with flow restrictors or aerators.	x	x	x	x	x	x	x	x	x	x	x	
		Install low-flow showerheads (≤ 6–9 L/min), faucet aerators, and dual-flush or low-flush toilets (≤ 4/6 L per flush).	x	x	x	x	x	x	x	x	x	x	x	
		Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	x	x	x	x	x	x	x	x	x	x	x	
		Integrate water metering per zone to monitor and manage usage												
	Cooling	Install a cooling system and units (On hold until complete audits are delivered)												

A

K

26

Other Environmental measures

Water savings

- Replace taps with sensor-activated taps, or self-closing taps, equipped with flow restrictors or aerators.
- Integrate water metering per zone to monitor and manage usage.
- Install low-flow showerheads ($\leq 6\text{--}9$ L/min), faucet aerators, and dual-flush or low-flush toilets ($\leq 4/6$ L per flush).
- Rainwater harvesting: Rainwater collection to reduce potable water demand, primarily for the irrigation of landscaped areas.
- Awareness: Promote water conservation among students and staff through educational signage.

Landscape and biodiversity

- Permeable and light color paving in parking and pedestrian areas to reduce soil sealing and allow water infiltration
- Elevate the ground floor level of new buildings to mitigate flood risk.
- Favor native, drought-resistant species to reduce irrigation needs and support local biodiversity.
- Upgrade stormwater management system to reduce the risks of flooding, waterlogging, and soil erosion during increasingly frequent heavy rainfall events
- Use of bioswales (shallow, vegetated channels designed to slow, filter, and infiltrate stormwater runoff)
- Plant trees along pedestrian pathways and roads to create green corridors for urban wildlife, and combat heat islands. Use medium and high-stem tree species to create shaded microclimates that reduce heat islands, especially around hard surfaces like gym facades and restaurant terraces. Use vegetation belts around building entrances and sports halls to reduce heat gain or cold exposure.
- Introduce compost generated on site (from food waste and green waste) to improve soil quality and close the organic loop, and raise student awareness.

Solar panels

- Integrate solar panels for hot water production or electricity generation where feasible to reduce GHG emissions.

Summer comfort

Summer comfort for building occupants is subjective and depends on the many parameters. It can only be estimated with Dynamic thermal Simulation.

The parameters influence on summer comfort are the following:

- Air and surface temperatures : **operative temperature**

- Ambient air temperature influences the efficiency of the various heat exchanges between the human body and its environment.
- Average surface (walls, ceiling, floor) radiant temperature influences heat exchange by radiation between the human body and the walls of a building.

The operative temperature corresponds to the temperature actually felt by the occupants. It is the arithmetic average of the air temperature and the radiant temperature (temperature radiated by all the walls, ceiling and floor). $T_{Operative} = T_{Air} + T_{Surface} / 2$

- **Air relative humidity**

Influences the body's ability to evacuate energy by sweating. **Evaporative cooling** is the process by which the temperature of a surface or a body decreases as a liquid (usually water) evaporates from it. In the human body, sweating relies on evaporative cooling : the evaporation of sweat from the skin removes heat and helps regulate body temperature.

- **Air velocity**

Air velocity refers to the speed of air movement around the human body. It influences convective heat exchange by either enhancing or reducing the transfer of heat between the skin and the surrounding air. When air velocity increases, it generally improves heat loss by convection and aids evaporation of sweat, helping cool the body. When air velocity is low, heat dissipation slows down, making the body feel warmer, especially in humid conditions.

- **Physical activity** of the users

Metabolism, the production of heat by the human body to maintain its internal temperature at around 36.7°C. This heat production is therefore linked to the activity of the various occupants, and increases as activity intensifies. It is also influenced by psychological and behavioral parameters (difficult to estimate).

- **Clothing**

provides a thermal resistance to heat exchange between the skin surface and the environment.

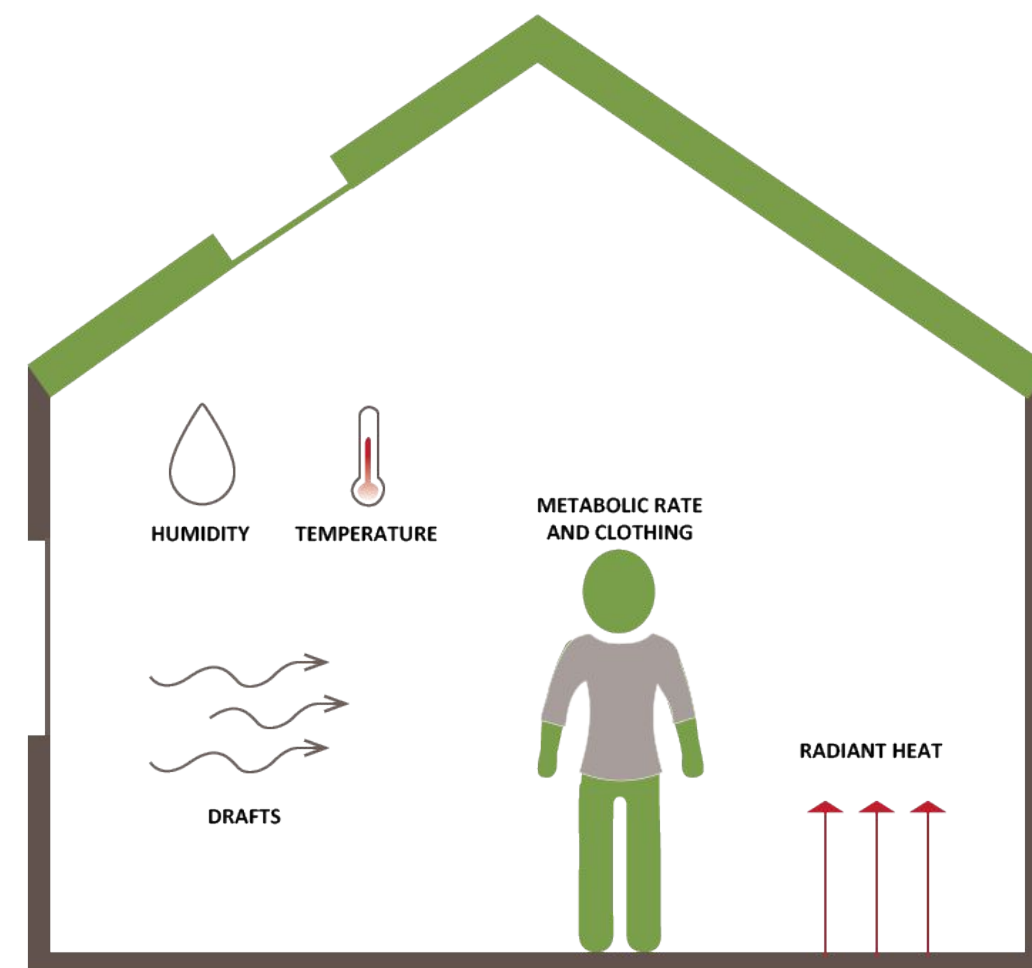
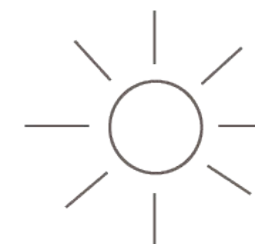
It acts as an insulating layer, reducing heat loss in cold conditions and limiting heat gain in hot environments.

- Sharp difference between indoor and outdoor temperature

A sharp difference between indoor and outdoor temperatures can cause thermal discomfort, particularly in summer.

The human body retains a memory of recent climatic conditions and does not adapt well to sudden temperature changes.

To maintain comfort, gradual acclimatization to different thermal environments is necessary.



Disclaimer for the draft version of the program

- At this stage of the study, the complete audits of the two dormitories have not yet been completed; therefore, the system recommendations remain preliminary and may be revised in the final version of this deliverable.
- Additionally recommendations on sanitary/plumbing are not presented in this version
- Some passive and active measures have not been priced.
- Some passive measures are still under review : shutters, solar shades etc.
- Dormitory ventilation and cooling system is still under review.
- Solar panels cost are not included.



5

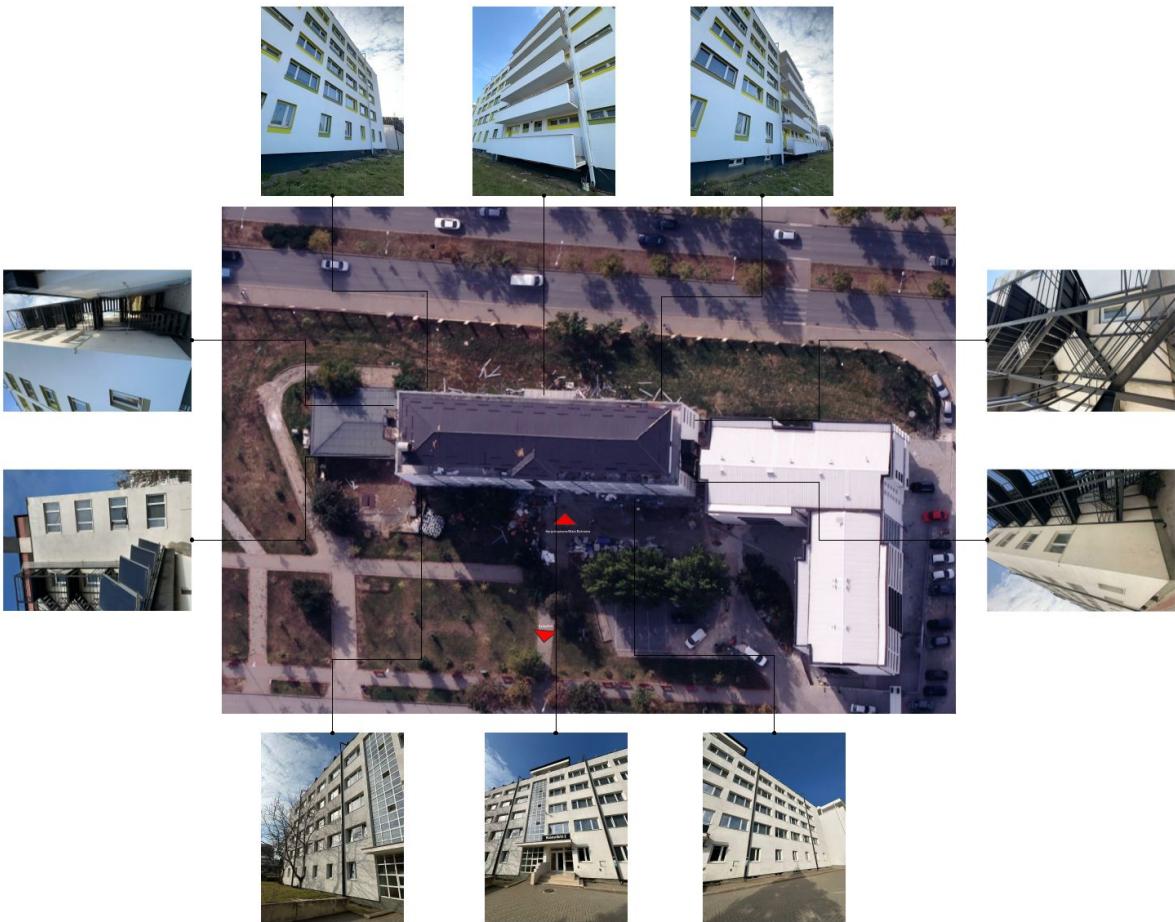
STUDENT CENTER

Technical assessment, Audit Results & EE measures

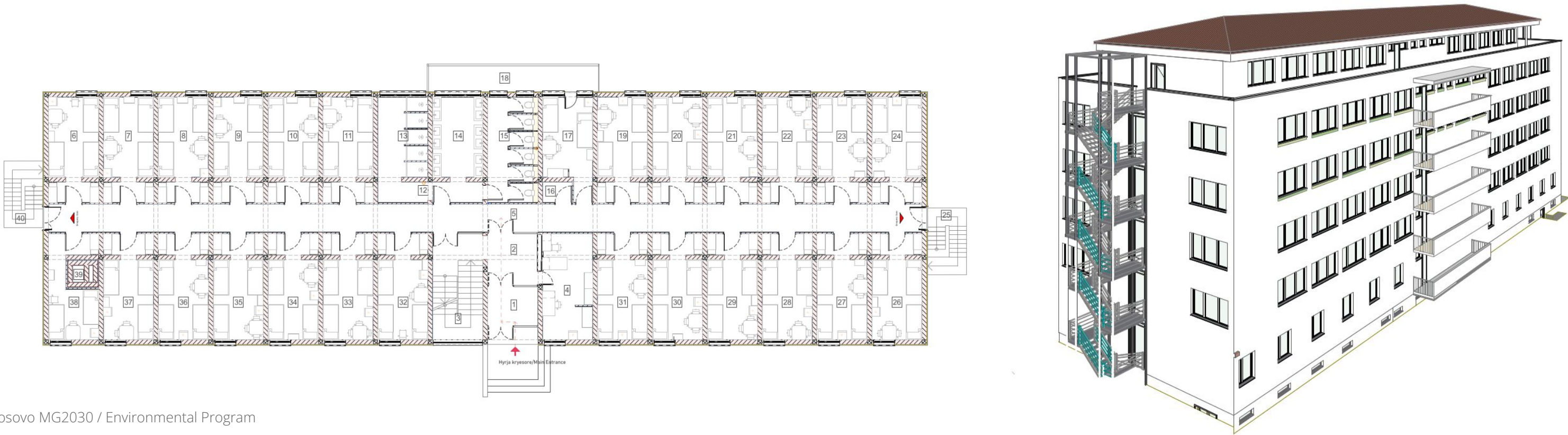
DORMITORY TYPE 1

Dormitory 1

DORMITORY TYPE 1 - Building Characteristics	
General characteristics	
Dormitory/ies concerned	DORMITORY 1
Year of construction	1967
Number of Levels	5 Storey-building
Total Net Area	4 385 m ² (around 630 sqm per floor)
Heated area	2 793 sqm
Room Occupancy and Facilities	Most rooms on floors 1 to 4 accommodate 3 students , with a few 2-student rooms. The 5th floor has only 2-student rooms . Shared bathrooms on all floors.
Estimated occupancy Capacity (Rooms + Shared Spaces)	446
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	Hollow bricks (clay block) of 25cm
Isolation type & Thickness (cm)	ETICS : polystyrene insulation of 5 cm



Architectural plan of the ground floor and a perspective view, providing an overview of the building's general layout :



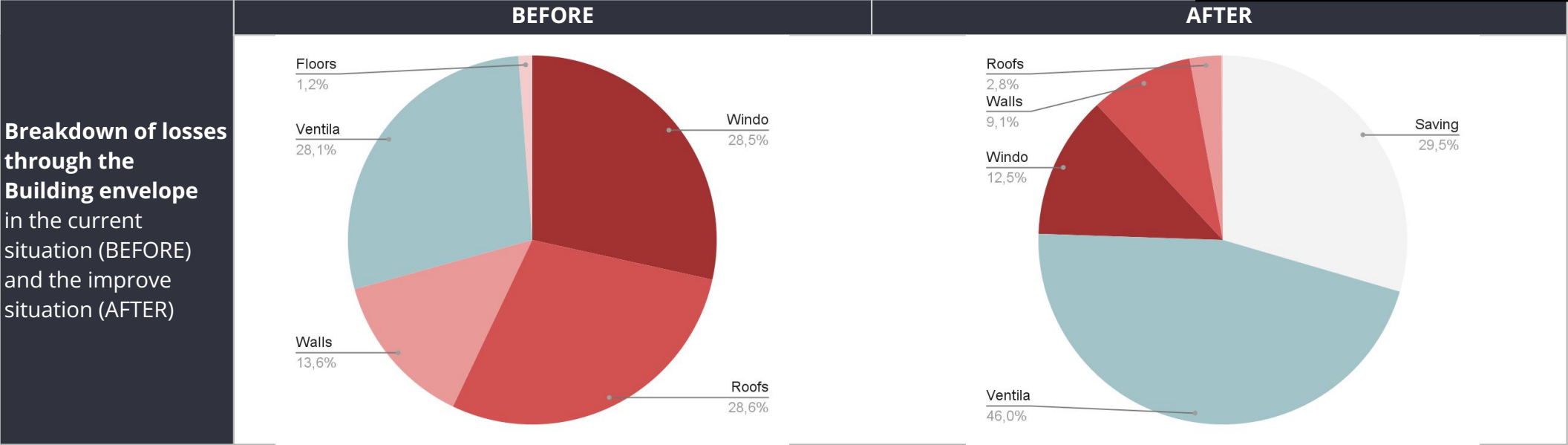
The opposite table presents with the following information for **Dormitory type 1** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 1](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 1	1965	4385,29	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	1474653,9	336,3	529,6
After EE measures	1071111,9	244,3	378,3
Savings	-403542,1	-92,0	-151,4
	-27,37%	-28,58%	-34,62%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm	62 825,20 €
	Roofs	Installing thermal insulation on the roof slab, minimum 12cm XPS mineral wool	32 199,70 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS	75 760,80 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	132 348,00 €
Systems	Heating	Replacing obsolete radiators Seal and insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing)	-
	Ventilation	Installation of single-flow extraction ventilation.	-
	Lighting	Replace non-LED to LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors	-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate temperature control and limiting valves Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	-
TOTAL			€ 303 133,70



DORMITORY TYPE 2

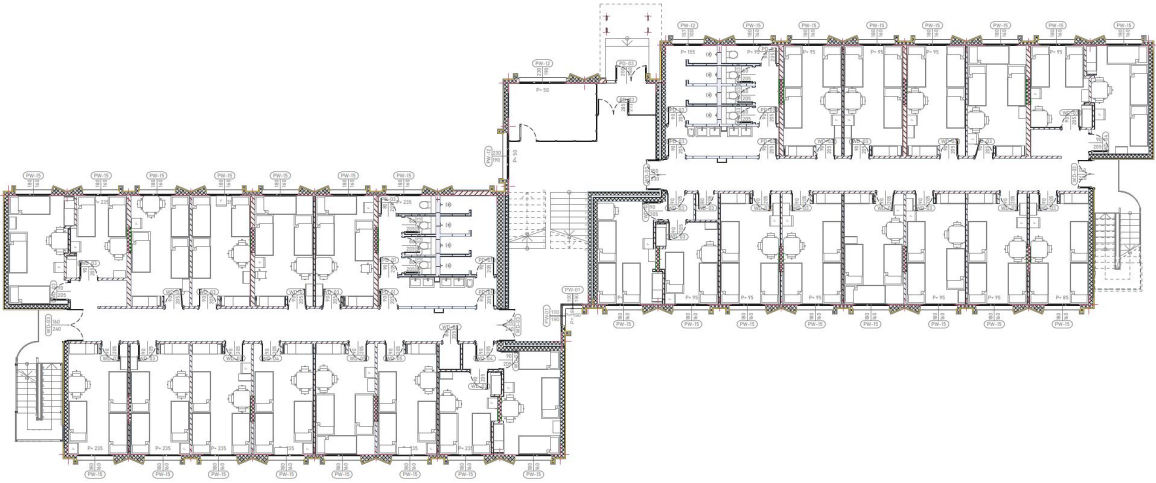
Dormitory 2

Dormitory 3

Dormitory 4

DORMITORY TYPE 2 - Building Characteristics	
General characteristics	
Dormitory/ies concerned	DORMITORY 2 (D2), DORMITORY 3 (D3), DORMITORY 4 (D4)
Year of construction	D2, D4 : 1967 D3 : 1969
Number of Levels	5 Storey-building
Total Net Area	D2 : 4 082 sqm / D4 : 4 107 sqm D3 : 5 728 sqm
Heated area	D2 : 2 854 sqm / D4 : 2 888 sqm D3 : 3 647 sqm
Room Occupancy and Facilities	D2 + D4 : Most rooms on floors 1 to 4 accommodate 3 students , with a few 2-student rooms. The 5th floor has only 2-student rooms.Shared bathrooms on all floors. D3 : Student spaces on Ground floor. GF to 4th Floor have rooms for 2-3 students with private bathrooms shared between 2 rooms. 5th floor have 2-bed rooms with private bathrooms and balconies.
Estimated occupancy Capacity (Rooms + Shared Spaces)	D2 : 494 / D3 : 634 / D4 : 483
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	Concrete of 20 cm
Isolation type & Thickness (cm)	ETICS : polystyrene insulation 5 cm

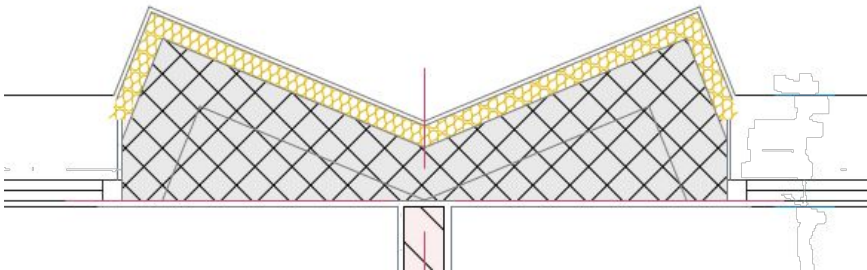
Architectural plan of the ground floors of D2/D4 and D3 and architectural detail, providing an overview of the building's general layout :



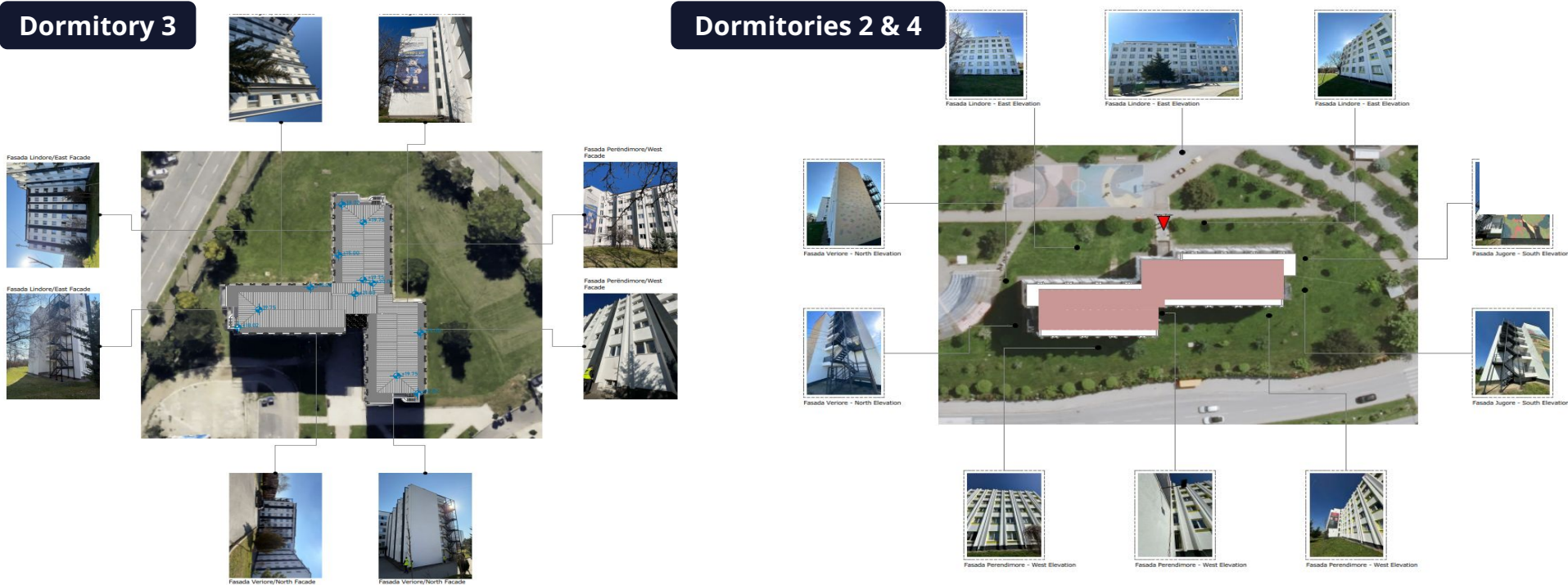
Ground floor - Dormitory 2 and 4



Ground floor - Dormitory 3



Architectural concrete detail



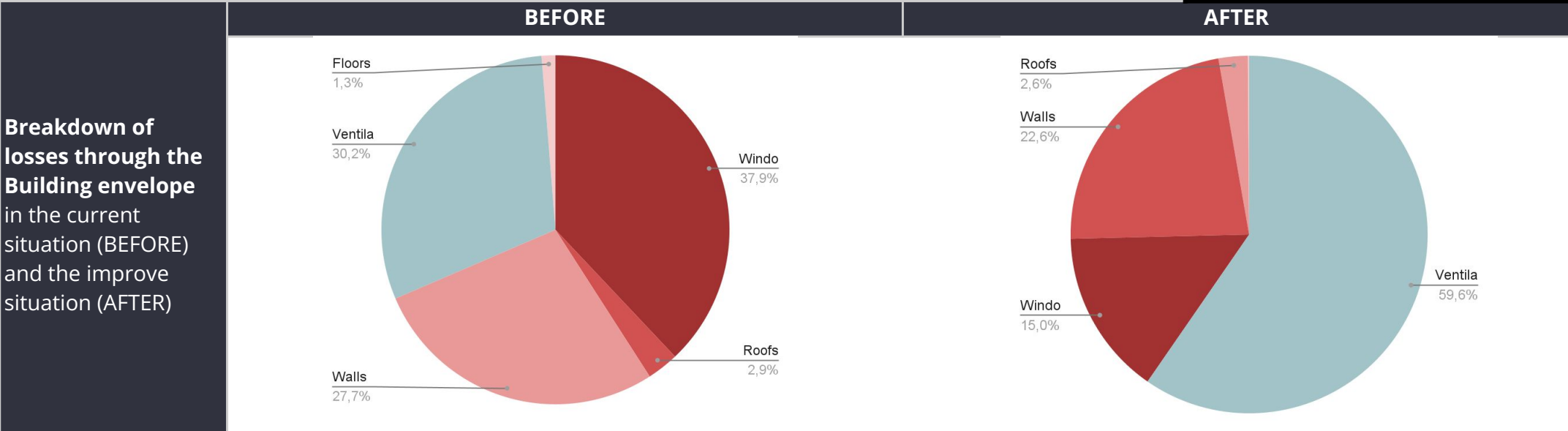
The opposite table presents with the following information for **Dormitory 2** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 2 & 4](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 2	1971	2854,54	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	1248368,4	305,8	435,4
After EE measures	1187557,4	290,9	409,8
Savings	-60811,0	-14,9	-25,6
	-4,87%		-5,89%
			-8,45%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm	89 454,40 €
	Roofs	-	-
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS	75 469,20 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	137 772,00 €
Systems	Heating	Replacing obsolete radiators Seal and insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing)	-
	Ventilation	Installation of single-flow extraction ventilation.	-
	Lighting	Replace non-LED to LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors	-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate temperature control and limiting valves Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	-
TOTAL			€ 302 695,60

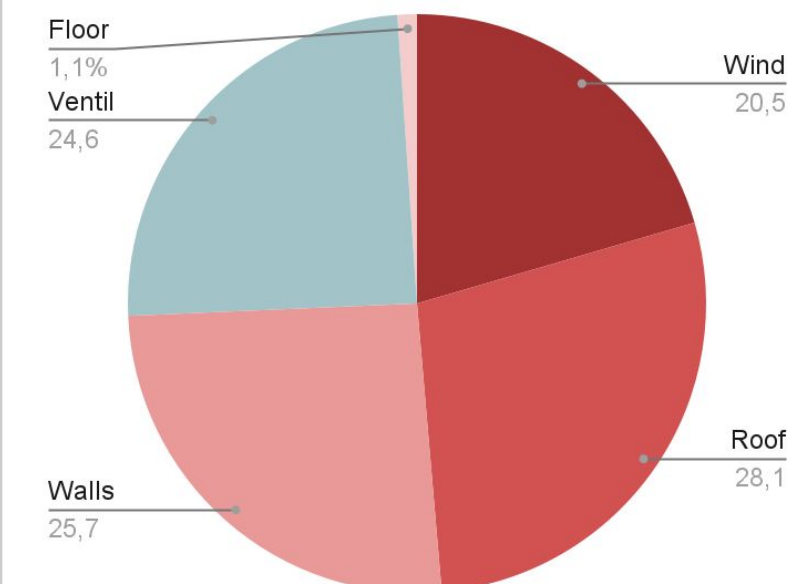
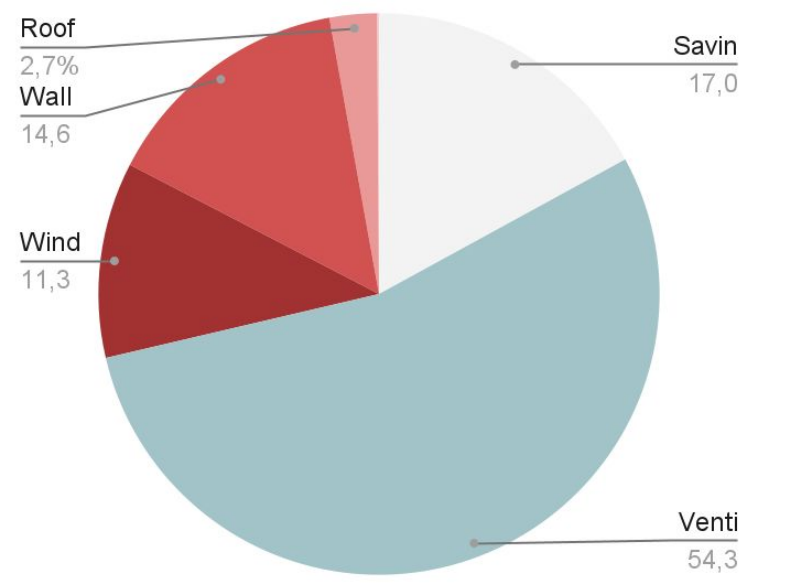


The opposite table presents with the following information for **Dormitory 3** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 3](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 3	1963	3647,2	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	1836523,1	320,6	640,4
After EE measures	1539555,5	268,8	539,5
Savings	-296967,6	-51,8	-101,0
	-16,17%		-15,77%
			-20,64%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm	107 136,20 €
	Roofs	Installing thermal insulation on the roof slab, minimum 12cm XPS mineral wool	45 045,65 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS	112 966,80 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	150 956,50 €
Systems	Heating	Replacing obsolete radiators Seal and insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing)	-
	Ventilation	Installation of single-flow extraction ventilation.	-
	Lighting	Replace non-LED to LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors	-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate temperature control and limiting valves Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	-
TOTAL			€ 416 105,15
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER
			

The opposite table presents with the following information for **Dormitory 4** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

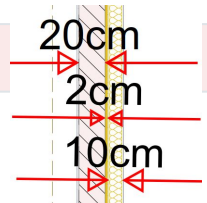
Refer to the [Walkthrough Energy audit Konvikti 2 & 4](#) for more details on the Energy Efficiency measures.

General data				
Building's name		Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 4		1967	2887,95	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	1219965,9	297,0	420,2	111 836,77 €
After EE measures	1128182,4	274,7	389,8	94 208,76 €
Savings	-91783,5	-22,3	-30,4	-17 628,01 €
	-7,52%		-7,24%	-15,76%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm		89 454,40 €
	Roofs	-		-
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		75 469,20 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie		137 772,00 €
Systems	Heating	Replacing obsolete radiators Seal and insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing)		-
	Ventilation	Installation of single-flow extraction ventilation.		-
	Lighting	Replace non-LED to LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors		-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate temperature control and limiting valves Introduce thermostatic mixing valves (TMVs), pre-set max temperature control		-
TOTAL				€ 302 695,60
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

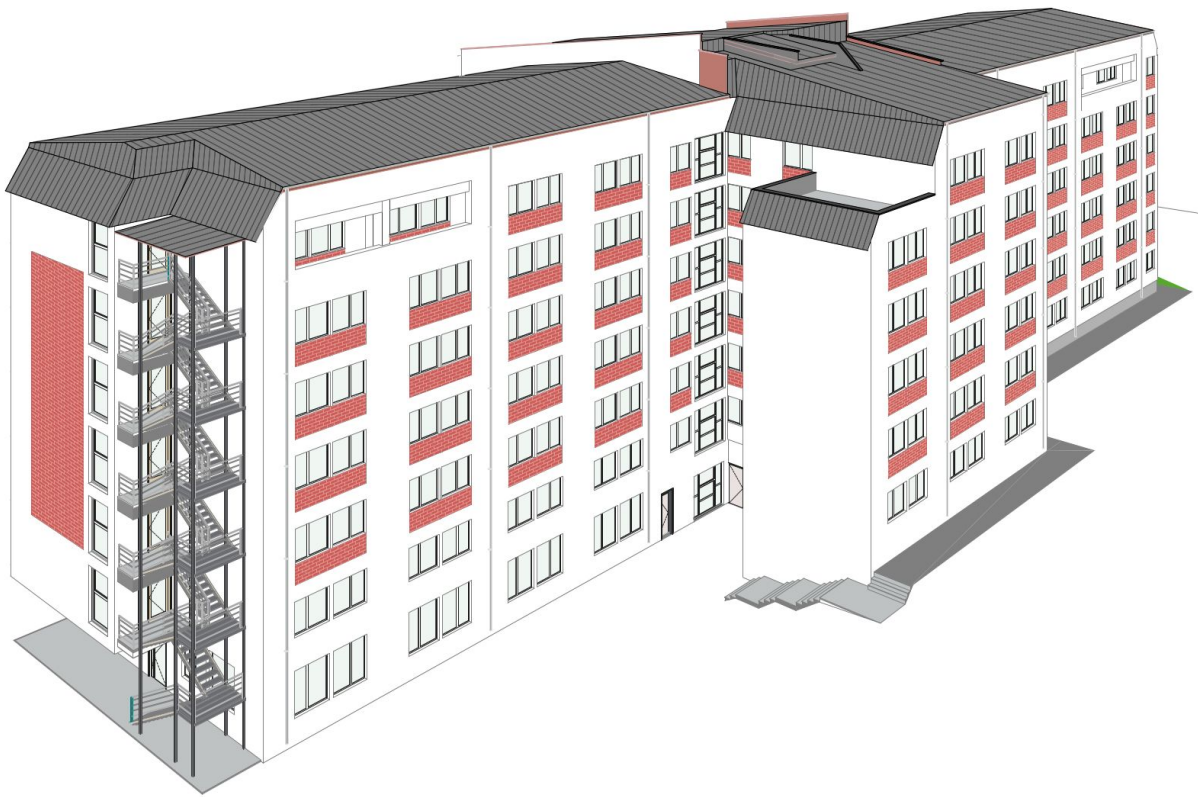
DORMITORY TYPE 3

Dormitory 5

DORMITORY TYPE 3 - Building Characteristics	
General characteristics	
Dormitory/ies concerned	DORMITORY 5
Year of construction	1980
Number of Levels	7 Storey-building
Total Net Area	9 840 sqm
Heated area	5 777
Room Occupancy and Facilities	Lower ground floor contains only common areas (e.g. workspaces). Ground floor + 5 floors : mostly 3-bed rooms with shared bathrooms on each floor, as well as 1 room for 4 and a few 2-bed rooms.
Estimated occupancy Capacity (Rooms + Shared Spaces)	810
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	Hollow bricks (clay block) for the majority of walls of 20 cm
Isolation type & Thickness (cm)	ETICS : 2cm insulation against bricks and polystyrene insulation with 10 cm of air in between



Architectural plan of the ground floor and a perspective view of Dormitory 5, providing an overview of the building's general layout :



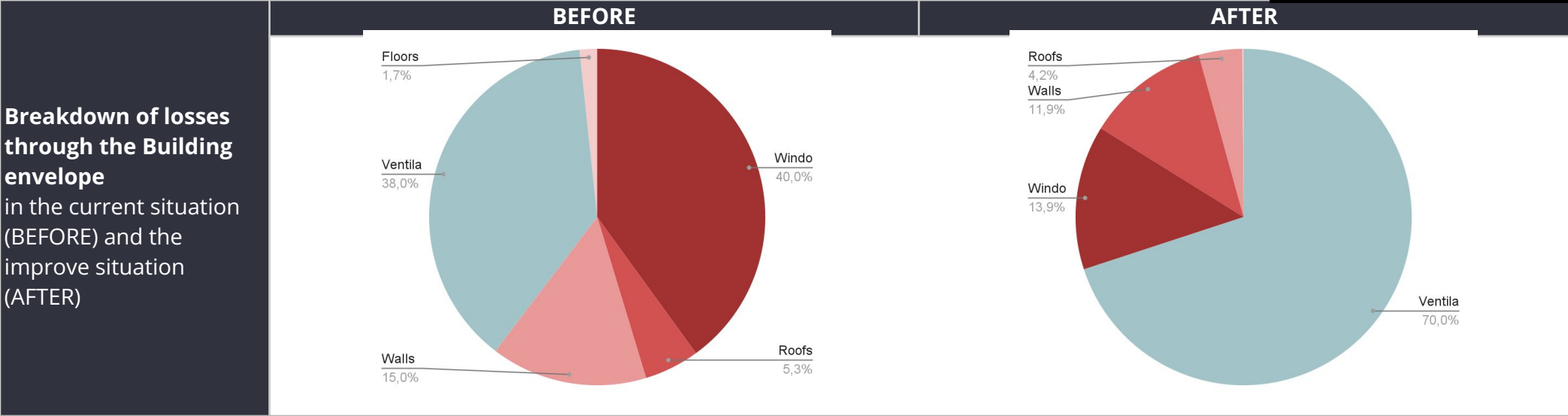
The opposite table presents with the following information for **Dormitory 5** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 5](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 5	1980	5777,47	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	2021626,8	235,3	723,9
After EE measures	2039908,3	237,4	721,2
Savings	18281,5	2,1	-2,7
	0,90%		-0,37%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	External Walls Type 2 : Adding additional layer of thermal insulation minimum thickness 10.0cm	20 060,00 €
	Roofs	-	-
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS	155 968,80 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	185 718,50 €
Systems	Heating	Replacing obsolete radiators Seal and insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing)	-
	Ventilation	Installation of single-flow extraction ventilation.	-
	Lighting	Replace non-LED to LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors	-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate temperature control and limiting valves Introduce thermostatic mixing valves (TMVs), pre-set max temperature control	-
TOTAL			€ 361 747,30



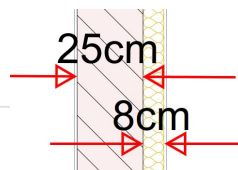
DORMITORY TYPE 4

Dormitory 6

Dormitory 7

Dormitory 8

DORMITORY TYPE 4 - Building Characteristics	
General characteristics	
Dormitory/ies concerned	DORMITORY 6 (D6), DORMITORY 7 (D7), DORMITORY 8 (D8)
Year of construction	D6, D7 : 2007 D8 : 2014
Number of Levels	7 Storey-building
Total Net Area	D6 : 6 467 sqm / D7 : 6 181 sqm / D8 : 5 390 sqm
Heated area	D6 : 3 519 sqm / D7 : 3 407 / D8 : 3 085 sqm
Room Occupancy and Facilities	D6, D7, and D8 have 2-bed rooms with private bathrooms shared between 2 rooms per floor. D6 and D7 also include some 3-bed rooms and workspaces on the ground floor. All three have common spaces on the lower ground floor.
Estimated occupancy Capacity (Rooms + Shared Spaces)	D6 + D7 : 437 / D8 : 307
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	Hollow bricks (clay block) of 25 cm
Isolation type & Thickness (cm)	Polystyrene insulation on the outside of 8 cm

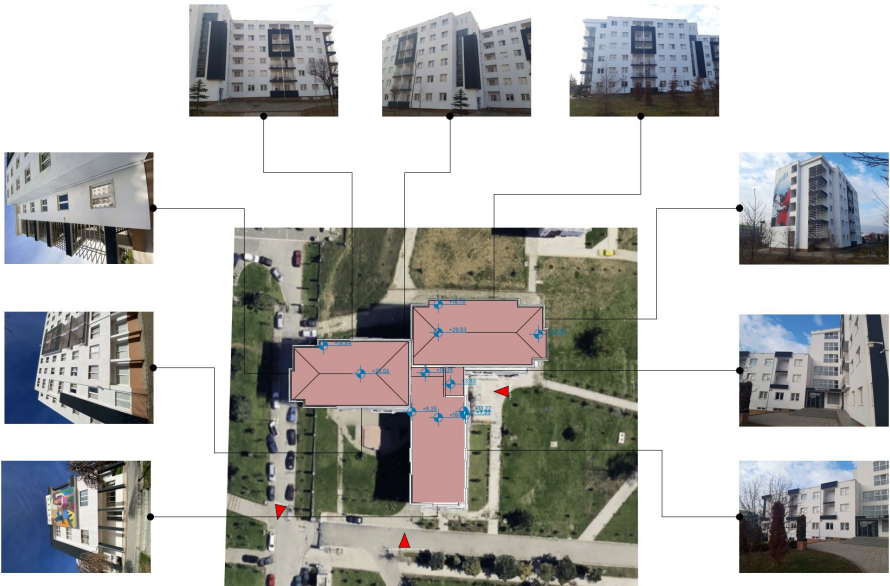


Architectural plan of Ground floors of D6/D7 and D8 and architectural detail, providing an overview of the building's general layout :



First floor - Dormitories 6 and 7

Dormitory 6 & 7



Dormitories 8



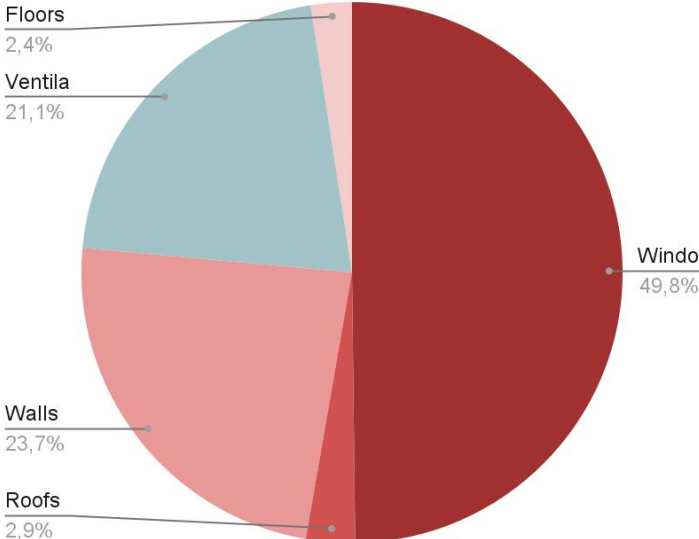
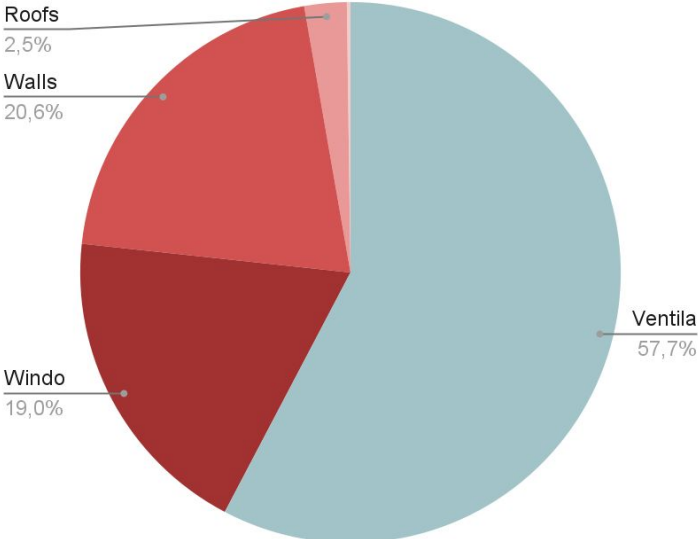
Plan typologie 4 dormitory 8

The opposite table presents with the following information for **Dormitory 6** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 6 & 7](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data				
Building's name		Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 6		2007	3519,03	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	1380655,7	213,5	506,9	160 376,30 €
After EE measures	1442155,7	223,0	535,1	156 392,01 €
Savings	61499,9	9,5	28,1	-3 984,29 €
	4,45%		5,55%	-2,48%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	-		-
	Roofs	-		-
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		155 564,40 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie		168 533,50 €
Systems	Heating	Insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing, routine bleeding and maintenance)		-
	Ventilation	Installation of single-flow extraction ventilation.		-
	Lighting	Inventory to confirm all lighting units ar LED, replace non LED by LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors		-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate water metering per zone to monitor and manage usage		-
TOTAL				€ 324 097,90
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	
				

The opposite table presents with the following information for **Dormitory 7** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 6 & 7](#) for more details on the General condition of the building and on Energy Efficiency measures.

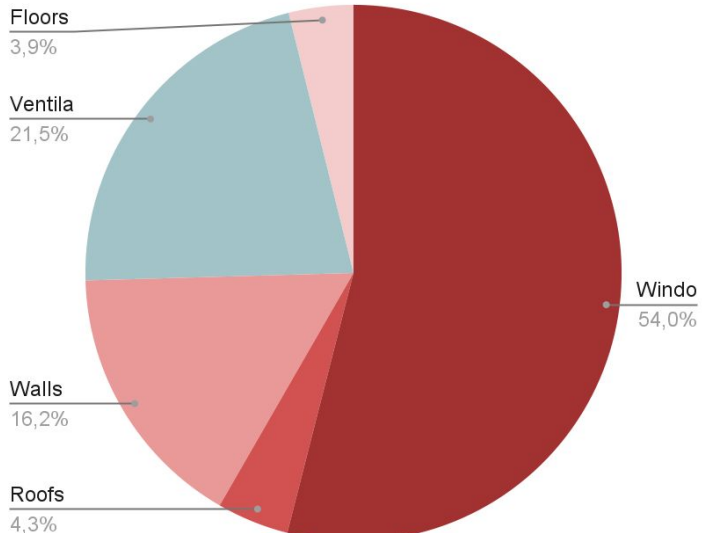
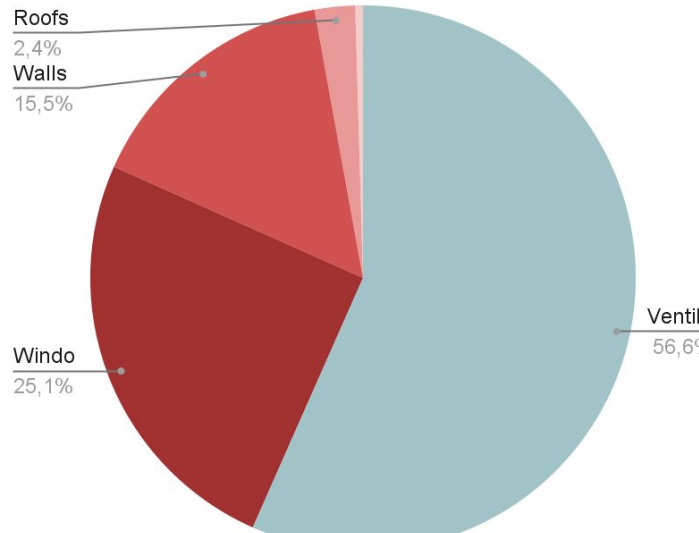
General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 7	2007	3406,99	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	1360488,1	223,7	494,3
After EE measures	1383432,7	227,5	509,1
Savings	22944,5	3,8	14,7
	1,69%		2,98%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	-	-
	Roofs	-	-
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS	155 564,40 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	168 533,50 €
Systems	Heating	Insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing, routine bleeding and maintenance)	-
	Ventilation	Installation of single-flow extraction ventilation.	-
	Lighting	Inventory to confirm all lighting units ar LED, replace non LED by LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors	-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate water metering per zone to monitor and manage usage	-
TOTAL			€ 324 097,90
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER

The opposite table presents with the following information for **Dormitory 8** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

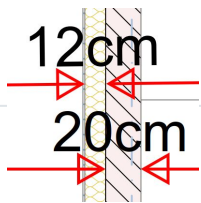
The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Konvikti 8](#) for more details on the General condition of the building and on Energy Efficiency measures.

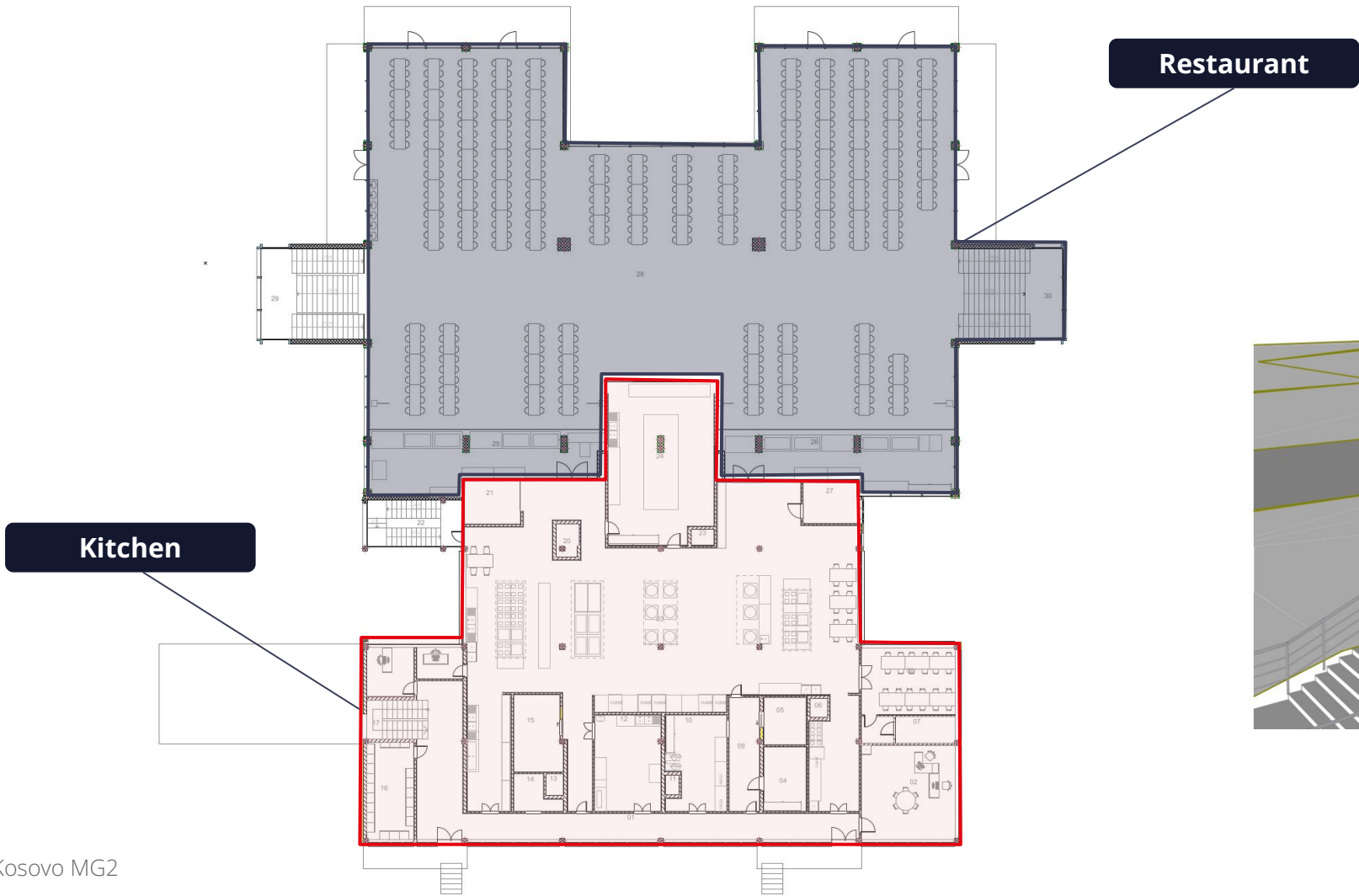
General data				
Building's name		Year of construction	Total covered area	Type of energy consumed for heating
Konvikti 8		2014	3085,22	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	1075601,9	199,6	398,7	127 352,60 €
After EE measures	1085377,6	201,4	407,4	121 677,92 €
Savings	9775,7	1,8	8,7	-5 674,69 €
	0,91%		2,18%	-4,46%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	-		-
	Roofs	Installing thermal insulation on the roof slab, minimum 8cm mineral wool		56 520,10 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		88 550,40 €
	Windows	Replacing all windows with new triple-glazing PVC windows (U=1,1W/m².K) with hygro-adjustable air inlet for ventilation with shutters (or any exterior solar protection) Replacing aluminum doors with double-glazing aluminum doors with Low-e folie		158 840,00 €
Systems	Heating	Insulate pipes Install Thermostatic Radiator Valves (TRV) Introducing Digital Control System (Conduct hydronic balancing, routine bleeding and maintenance)		-
	Ventilation	Installation of single-flow extraction ventilation.		-
	Lighting	Inventory to confirm all lighting units ar LED, replace non LED by LED Install Occupancy Sensors in Corridors and toilets Introduce Daylight-Sensitive Controls, in rooms and corridors		-
Sanitary		Upgrade to Sensor-Activated taps (Touchless) Replace manual taps with infrared sensor-based fixtures Integrate water metering per zone to monitor and manage usage		-
TOTAL				€ 303 910,50
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	
				

RESTAURANT and Kitchen

RESTAURANT and Kitchen - Building Characteristics	
General characteristics	
Year of construction	1974
Number of Levels	3 Storey-building
Total Net Area	4923 sqm
Heated area	1417 sqm
Estimated occupancy Capacity	1350
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	25cm Clay Block for some parts But mainly double glazing facade
Isolation type & Thickness (cm)	Polystyrene insulation on the outside of 12 cm



Architectural plan of the ground floor and a perspective view of Restaurant & Kitchen, providing an overview of the building's general layout :



The opposite table presents with the following information for the **Restaurant & Kitchen** :

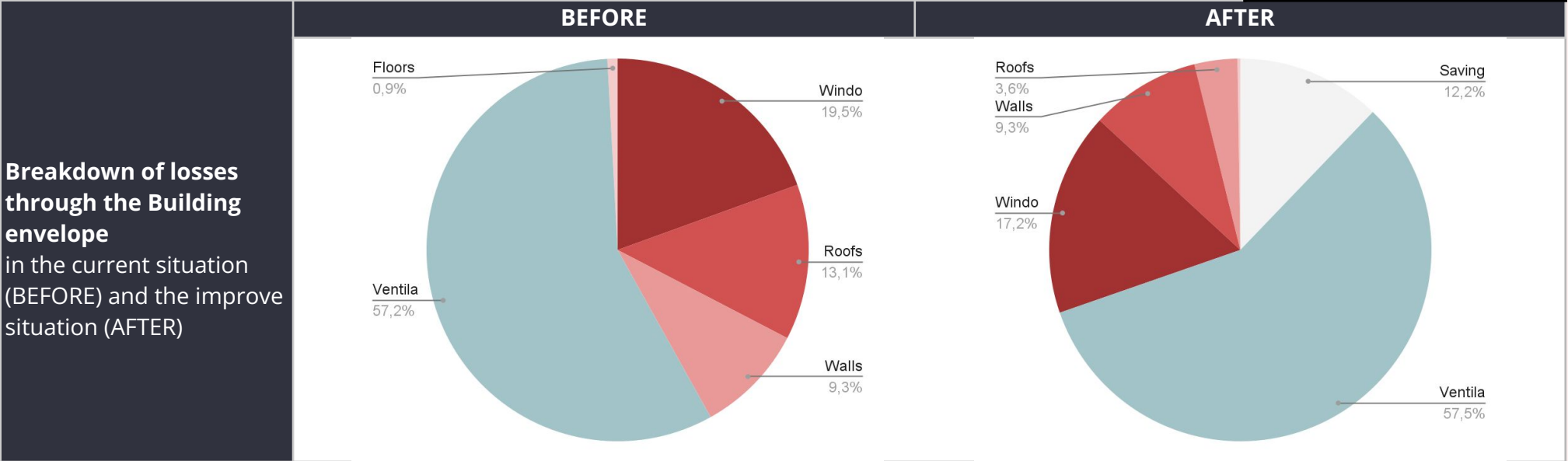
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Restaurant](#) for more details on the General condition of the building and on Energy Efficiency measures.

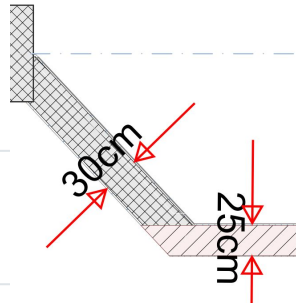
Heat recovery from fume hoods to heat the hall and office areas is a subject that should be studied to increase potential savings.

General data			
Building's name	Year of construction	Total covered area	Type of energy consumed for heating
University Restaurant	1974	1416,55	District heating power plant - COAL
Consumption, Emissions, Cost			
	Consumption (Final Energy)		GHG Emissions
	kWh/year	kWh/year/m²	T eq CO2/year
Before EE measures	529525,9	107,6	223,3
After EE measures	351063,8	71,3	145,8
Savings	-178462,1	-36,3	-77,5
	-33,70%		-34,71%
			-37,86%
Energy efficiency measures			
EE Measures			Cost
Envelope	Walls	-	-
	Roofs	Installing thermal insulation on the roof lab, minimum 10cm mineral wool	114 602,15 €
	Floors	Installing thermal insulation on the floor lab, minimum 10cm XPS	151 315,20 €
	Windows	Replacing PVC windows Aluminum and steel with new triple-glazing PVC windows with Low-e folie Replacing aluminum doors with double-glazing aluminum doors with Low-e folie	67 479,00 €
Systems	Heating	Replacing aging pipe insulation Inspect and balance flow Check ventilation clearance (dining area covers) Prepare for future expansion/backup	-
	Ventilation	Professional cleaning schedule Airflow balancing verification, Add hygienic inspection access panels and duct cleaning Sensor-based controls Fire safety review	-
	Lighting	Maintain Natural lighting Strategy Optimize artificial lighting performance (LED) Verify emergency lighting and code compliance	-
Sanitary		Replace taps cith sensor activated or aerato attachements or timed push taps	-
TOTAL			€ 333 396,35

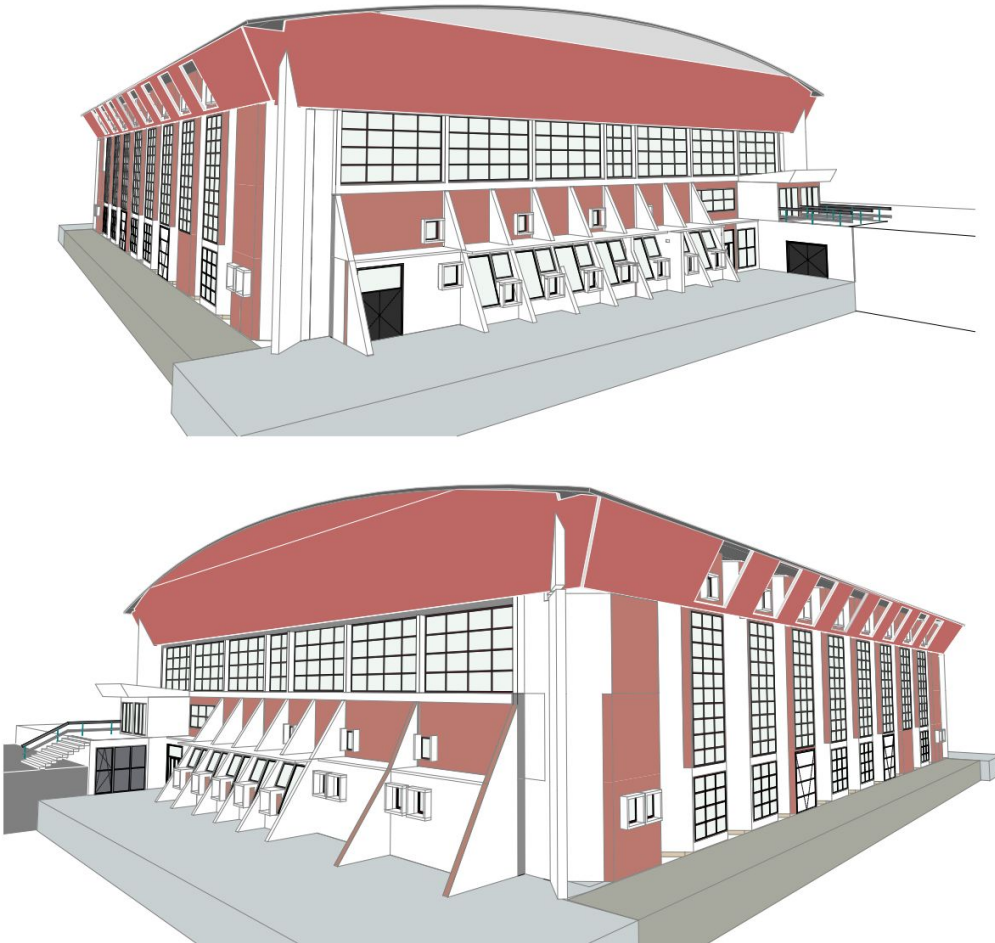
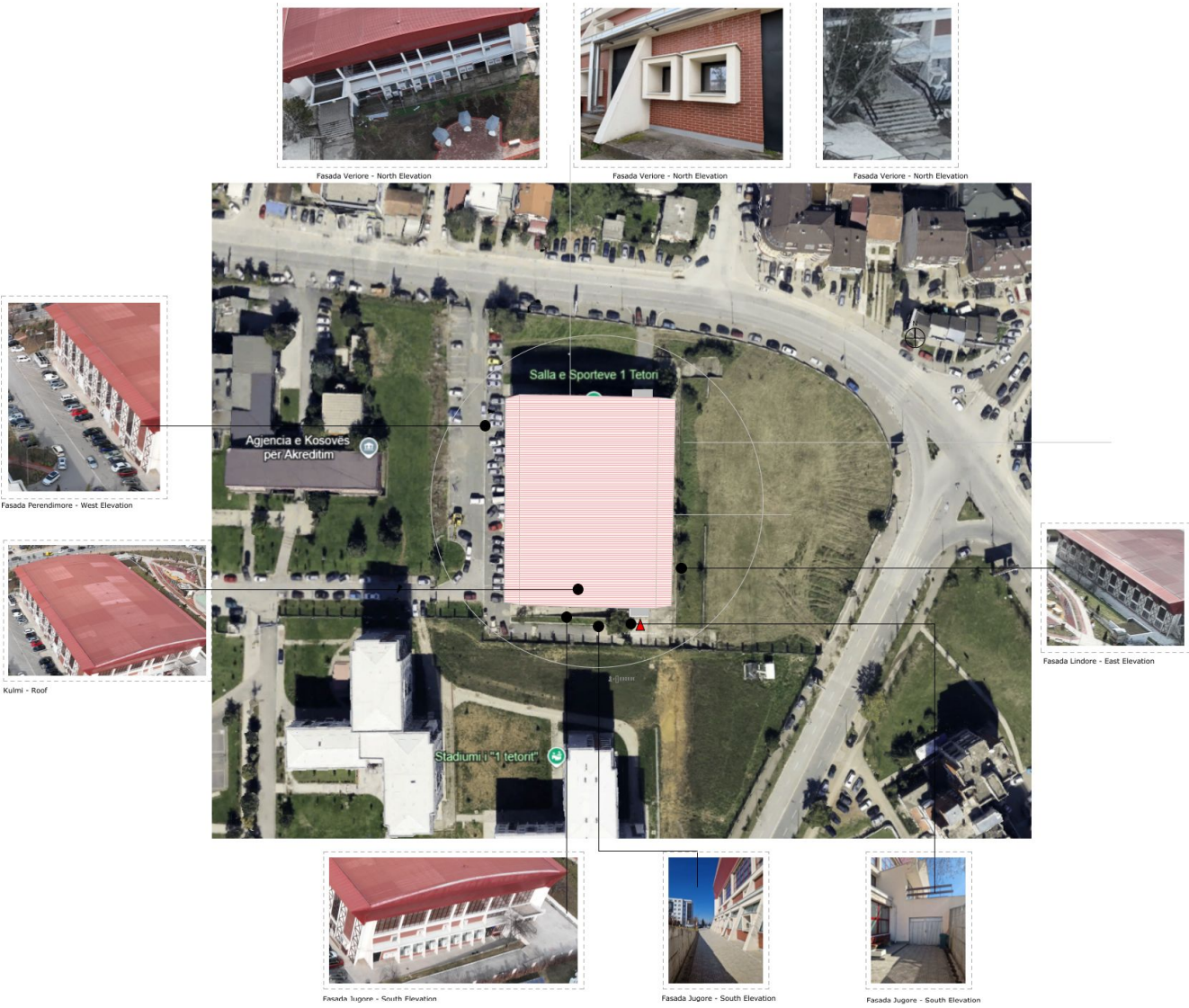
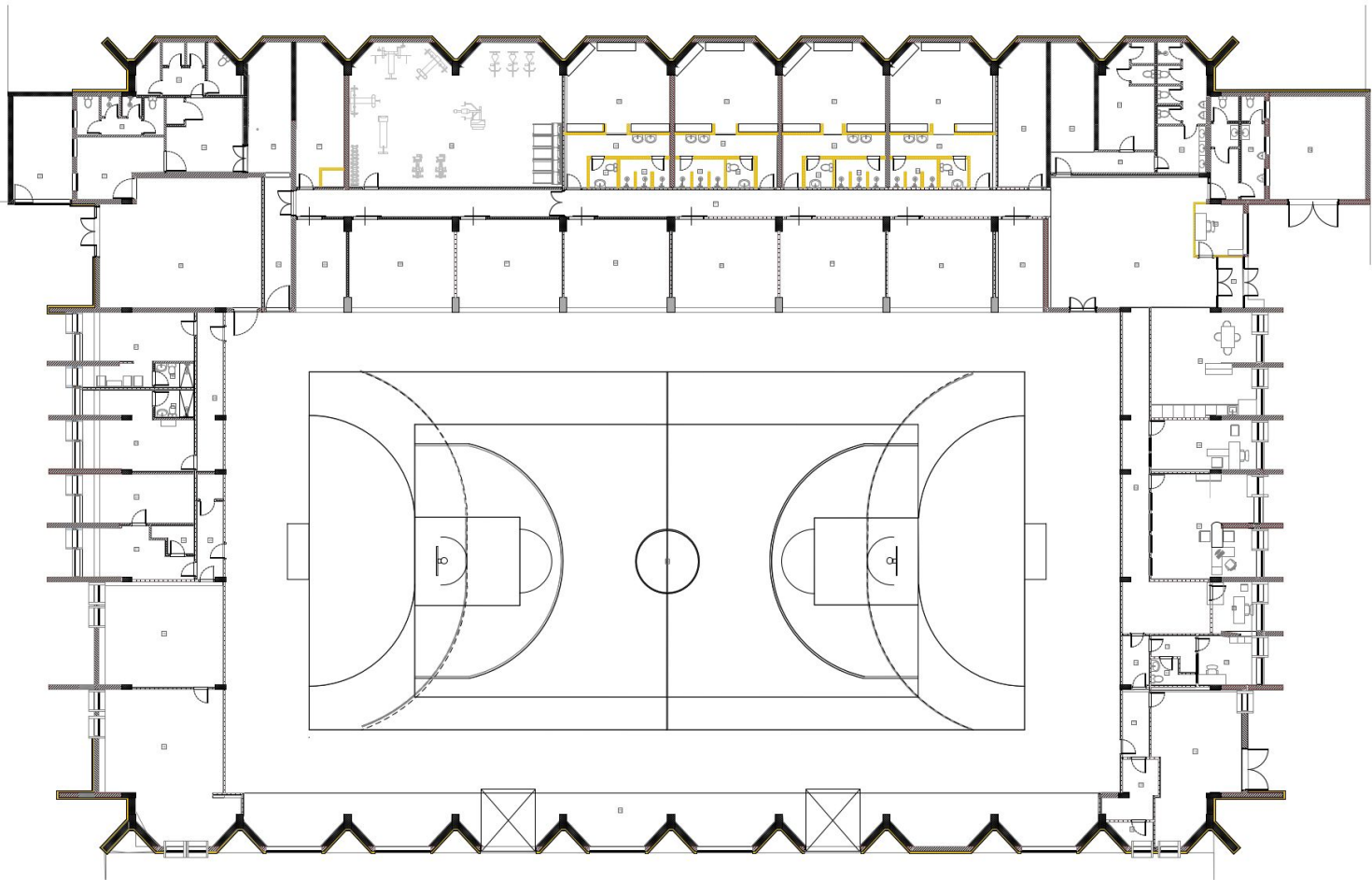


TETORI SPORTS HALL

TETORI SPORTS HALL - Building Characteristics	
General characteristics	
Year of construction	1975
Number of Levels	1 Storey-building
Total Net Area	3934 sqm
Heated area	1987 sqm
Estimated occupancy Capacity	Unknown Estimated for calcul : 1750 persons
Wall composition (measured on As-built drawing)	
Construction materials & Thickness (cm)	30cm Concrete 25cm Clay Block
Isolation type & Thickness (cm)	-



Architectural plan of the Level O.O and a perspective view of Tetori Sports hall, providing an overview of the building's general layout :

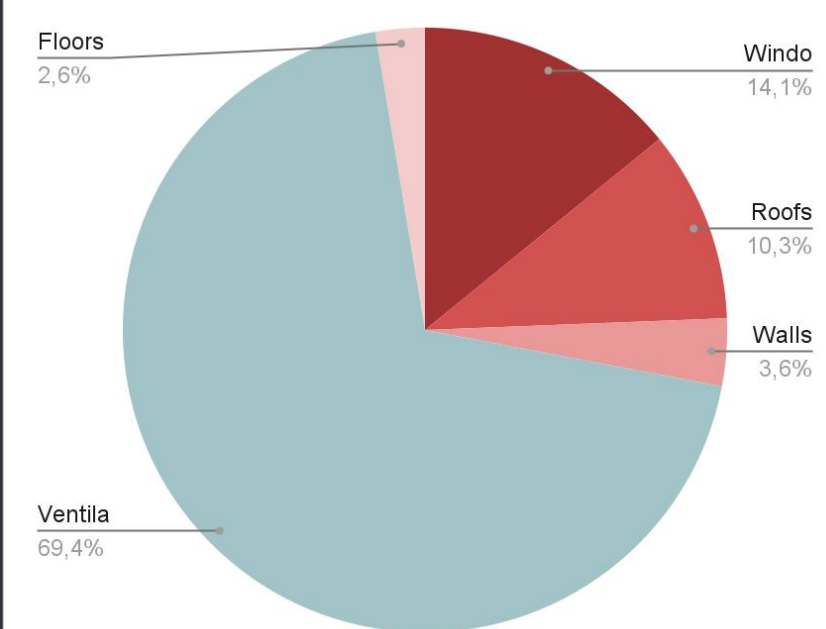
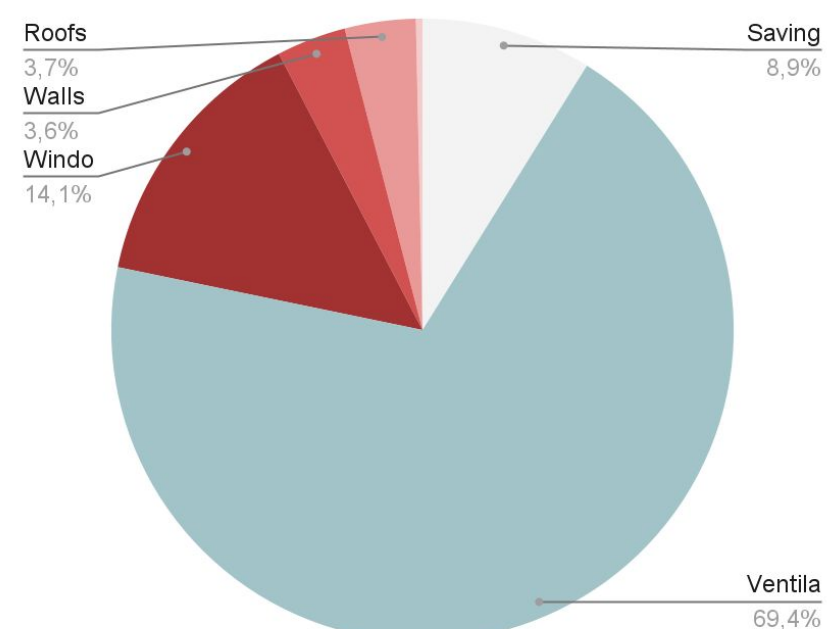


The opposite table presents with the following information for the **Tetori Sports Hall** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Tetori Sports hall](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data					
Building's name		Year of construction		Total covered area	Type of energy consumed for heating
University Sports'Hall		1975		1987,19	District heating power plant - COAL
Consumption, Emissions, Cost					
	Consumption (Final Energy)		GHG Emissions	Cost	
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year	
Before EE measures	436125,8	110,9	167,0	39 757,59 €	
After EE measures	309977,0	78,8	117,1	26 042,31 €	
Savings	-126148,8	-32,1	-49,8	-13 715,28 €	
	-28,92%		-29,84%	-34,50%	
Energy efficiency measures					
EE Measures					Cost
Envelope	Walls	-			-
	Roofs	Installing thermal insulation on the floor lab, minimum 10cm XPS			222 690,00 €
	Floors	Installing thermal insulation on the roof lab, minimum 10cm mineral wool			352 200,00 €
	Windows	Adding external sun protection			-
Systems	Heating	Insulate pipes Routine maintenance of fans heaters Zone control upgrades (digital thermostats, programmable timers)			-
	Ventilation				-
	Lighting	Installation of motion or occupancy sensors (particularly in toilets, storage, changing rooms) Periodic dusting of panels and visuel checks			-
Sanitary		Replacement of taps for water saving models Install aerators or flow restrictors Regular inspection and maintenance of all sanitary fixtures			-
TOTAL					€ 574 890,00
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE			AFTER	
					

NEW CONSTRUCTIONS

New construction : Energy and GHG emissions

- Additional 23 500 sqm to be built.
- Around 10 new buildings for various uses (dormitories, administration offices, pool, multi purpose hall, library, cafeteria, shops and kiosks)

New Buildings	Floor Area sqm
New Dormitory 01	5417
New Dormitory 02	4532
New Dormitory 03	8324
Administration	410
Health Center	955
Swimming pool	1300
Multi Purpose Hall	450
Cafeteria	160
Library	315
Commercial areas & Conference rooms	570



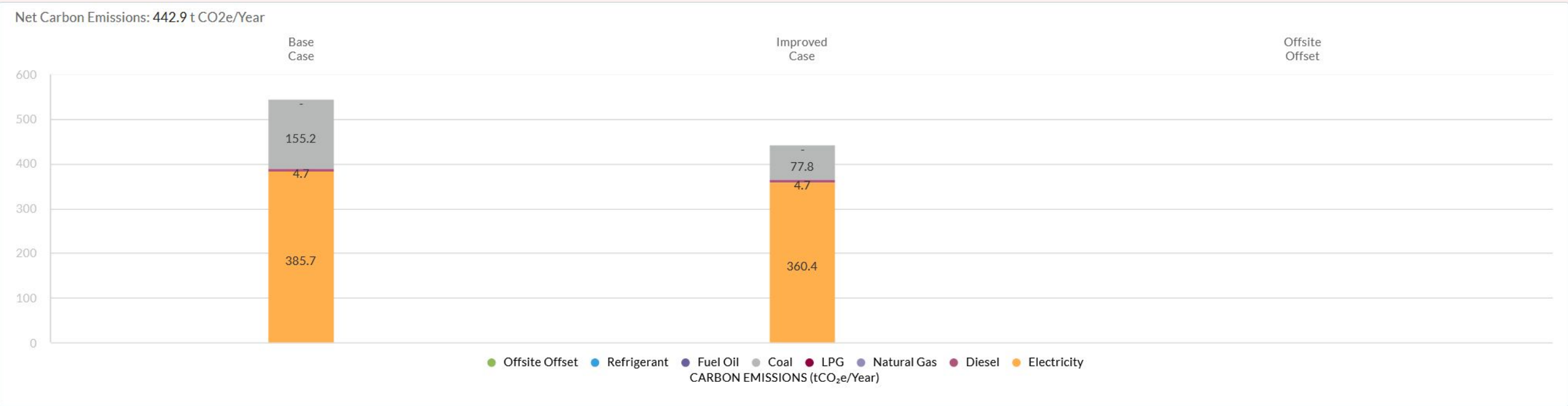
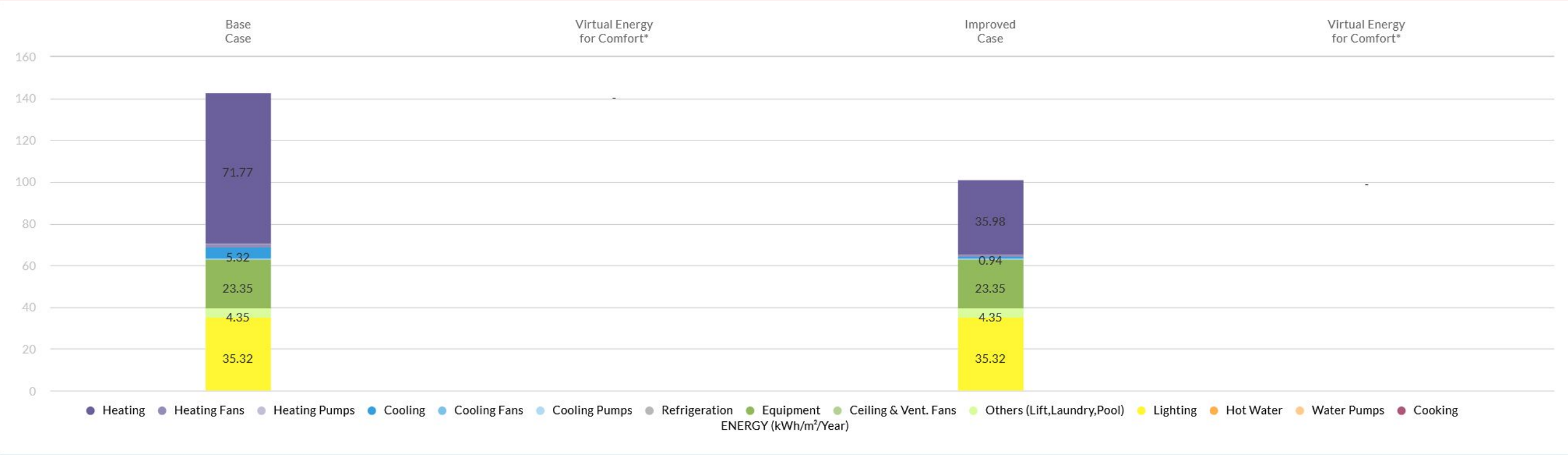
Energy consumption was estimated using efficiency metrics calculated with EDGE software.

The different energy efficiency measures implemented in both the baseline scenario and **the project scenario are summarized in the table below**, covering the 10 buildings planned for construction.

Building	EE Measures EDGE																									
	EEM01		EEM02		EEM03		EEM04		EEM05		EEM06		EEM08		EEM09		EEM11		EEM12		EEM17		EEM18		EEM33	
	Window-to-Wall Ratio		Reflective Roof: Solar Reflectance Index		Reflective Exterior Walls: Solar Reflectance Index		External Shading Devices: Annual Average Shading Factor (AASF)		Insulation of Roof: U-value W/m²·K		Insulation of Ground/Raised Floor Slab: U-Value W/m²·K		Insulation of Exterior Walls: U-Value W/m²·K		Efficiency of Glass: U-Value W/m²·K ; SHGC ; VT		Natural Ventilation		Ceiling Fans		Room Heating Controls with Thermostatic Valves		Domestic Hot Water (DHW) System : Solar % ; Boiler %		Onsite Renewable Energy: % of Annual Energy Use	
	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project	Base	Project
New Dormitory 01	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	50% ; 50%	0%	0%
New Dormitory 02	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	50% ; 50%	0%	0%
New Dormitory 03	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	50% ; 50%	0%	0%
Administration	40%	32%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	0% ; 100%	0%	0%
Health Center	27%	22%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	No	No	Yes	No	Yes	0% ; 100%	50% ; 50%	0%	0%
Swimming pool	22%	18%	45	85	45	85	0	0	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	No	No	No	No	Yes	0% ; 100%	50% ; 50%	0%	20%
Multi Purpose Hall	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	0% ; 100%	0%	0%
Cafeteria	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	0% ; 100%	0%	0%
Library	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	0% ; 100%	0%	0%
commercial areas & conference rooms	22%	18%	45	85	45	85	0	0,15	1,91	0,46	1,99	0,47	1,86	0,46	5,75 ; 0,49 ; 0,7	1,95 ; 0,3 ; 0,45	No	Yes	No	Yes	No	Yes	0% ; 100%	0% ; 100%	0%	0%

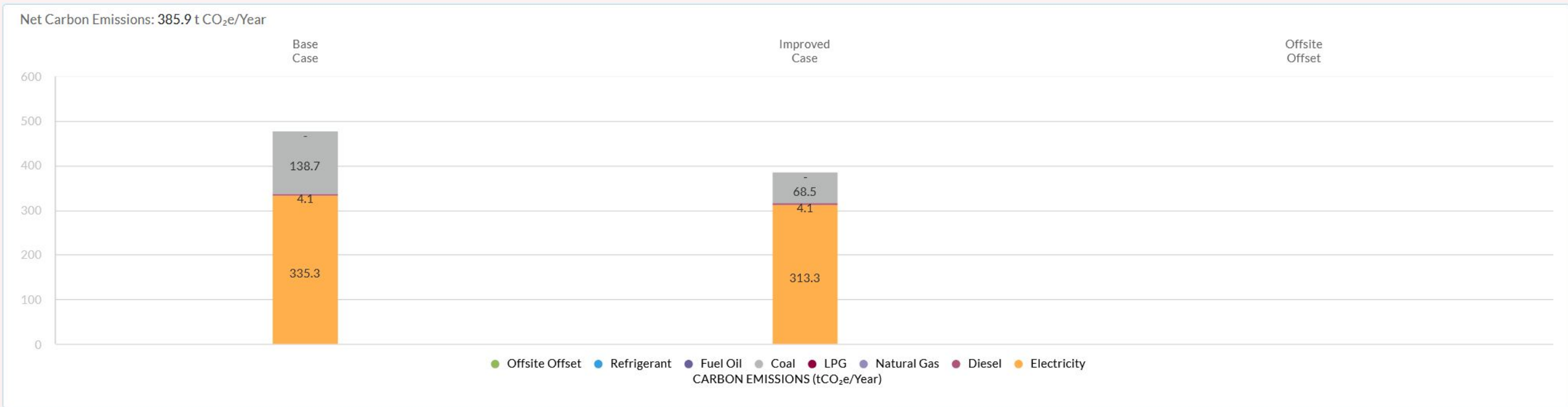
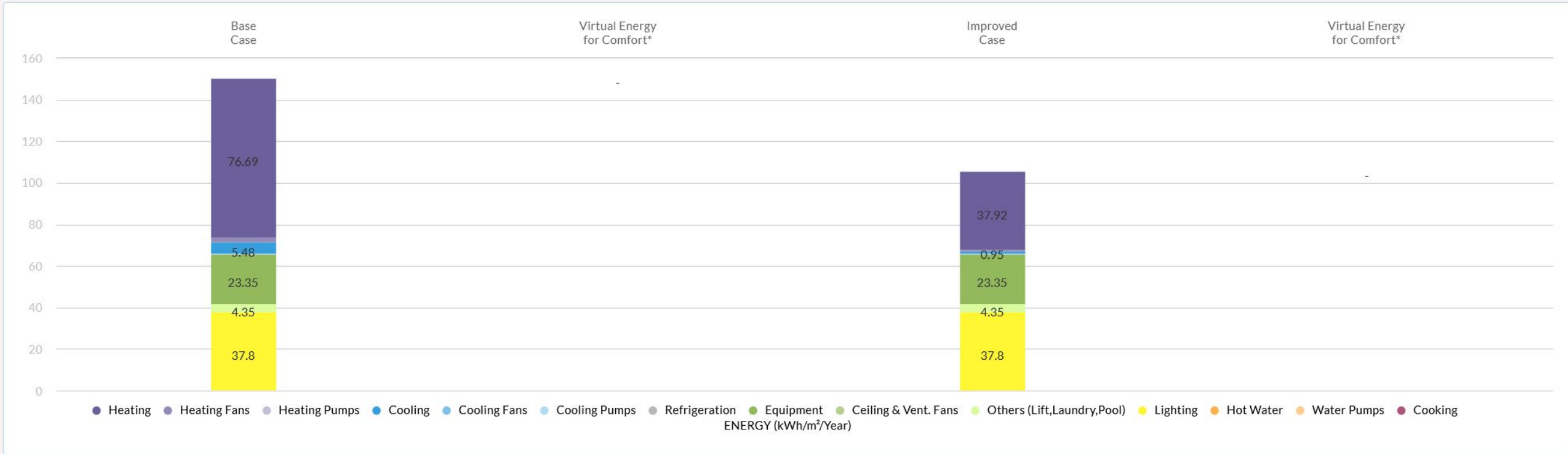
NEW DORMITORY 1

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
New Dormitory 01	5417	945364	175	672059	124	273,3	28,9%	102,7	18,8%



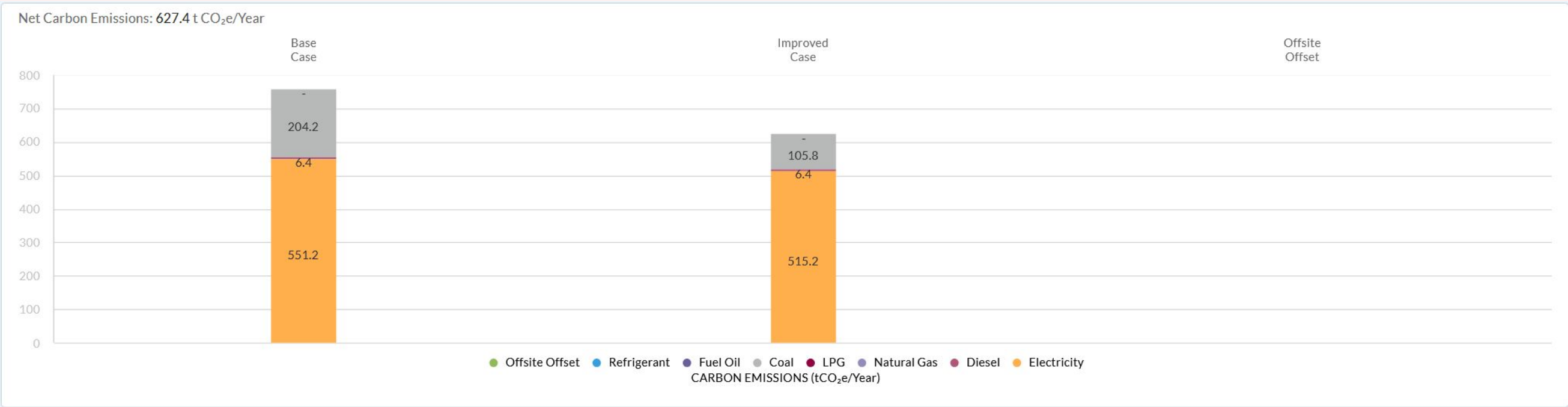
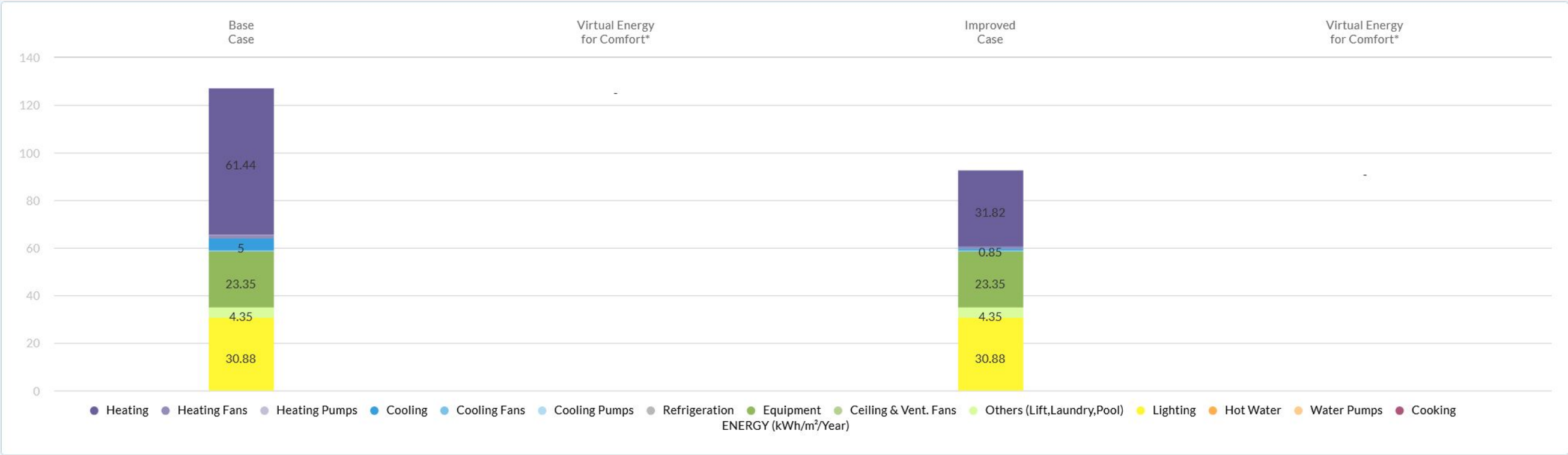
NEW DORMITORY 2

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
New Dormitory 02	4532	833694	184	587004	130	246,7	29,6%	92,2	19,3%



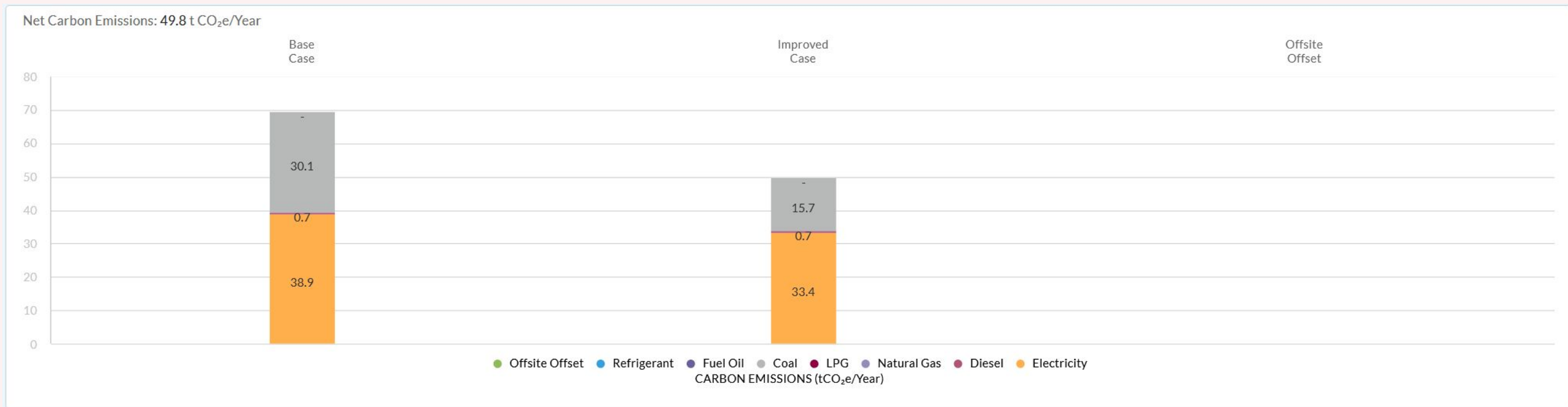
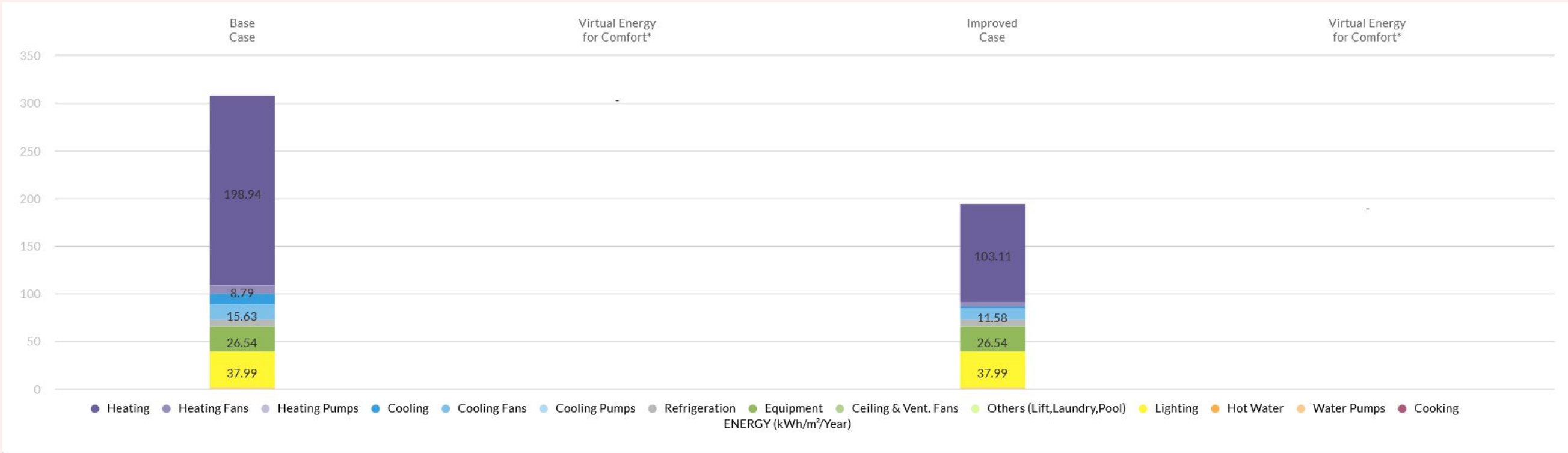
NEW DORMITORY 3

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
New Dormitory 03	8324	1295609	156	943592	113	352	27,2%	134,4	17,6%



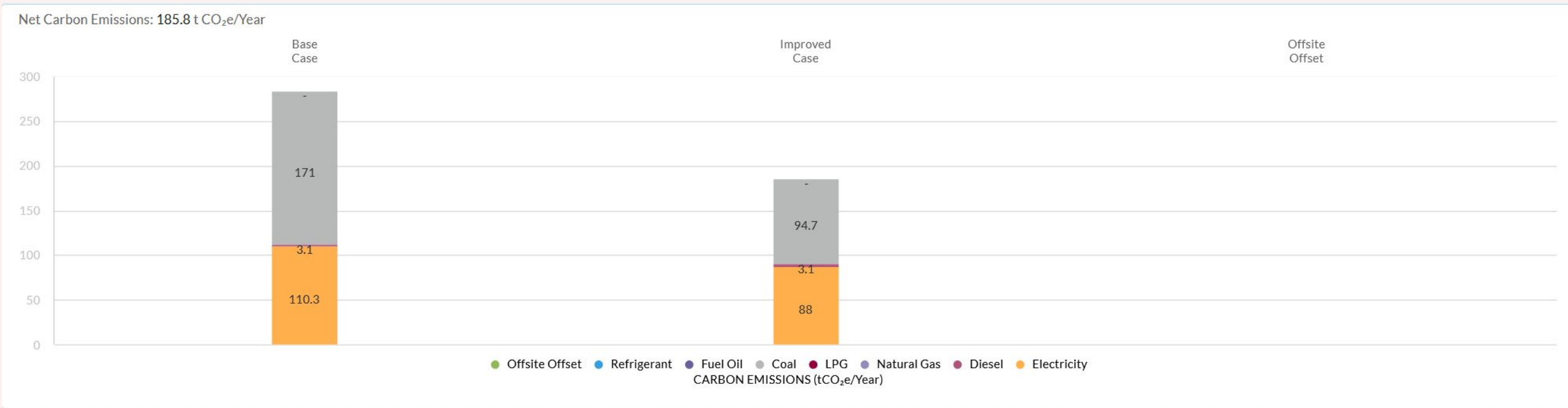
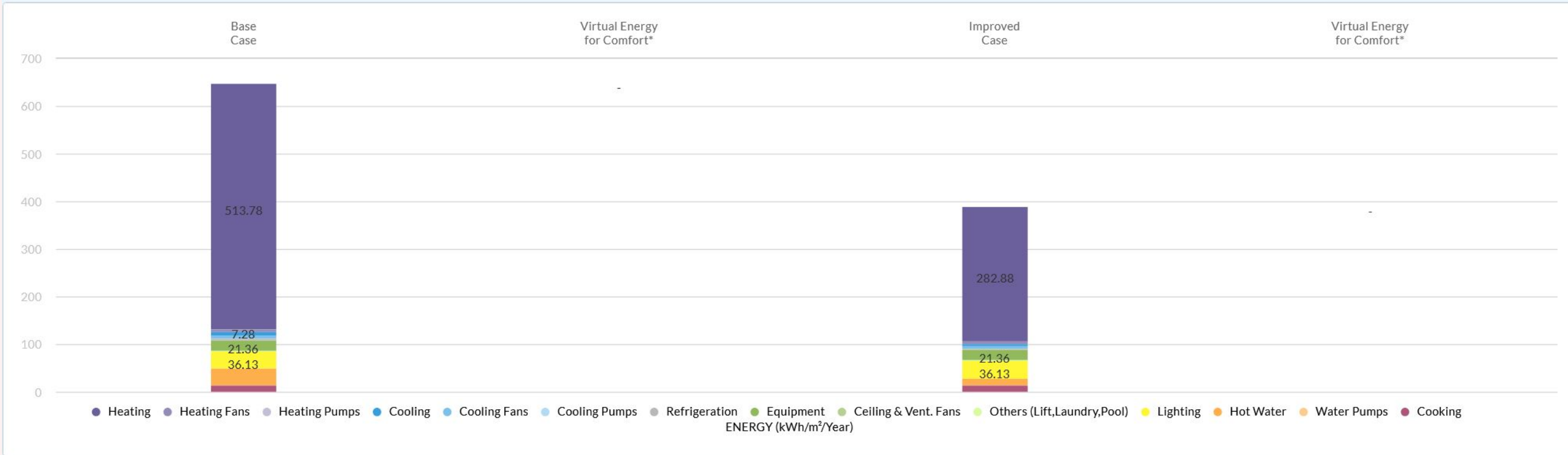
NEW ADMINISTRATION BUILDING

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Administration	410	198496	484	130928	319	67,6	34,0%	56,9	28,4%



NEW HEALTH CENTER BUILDING

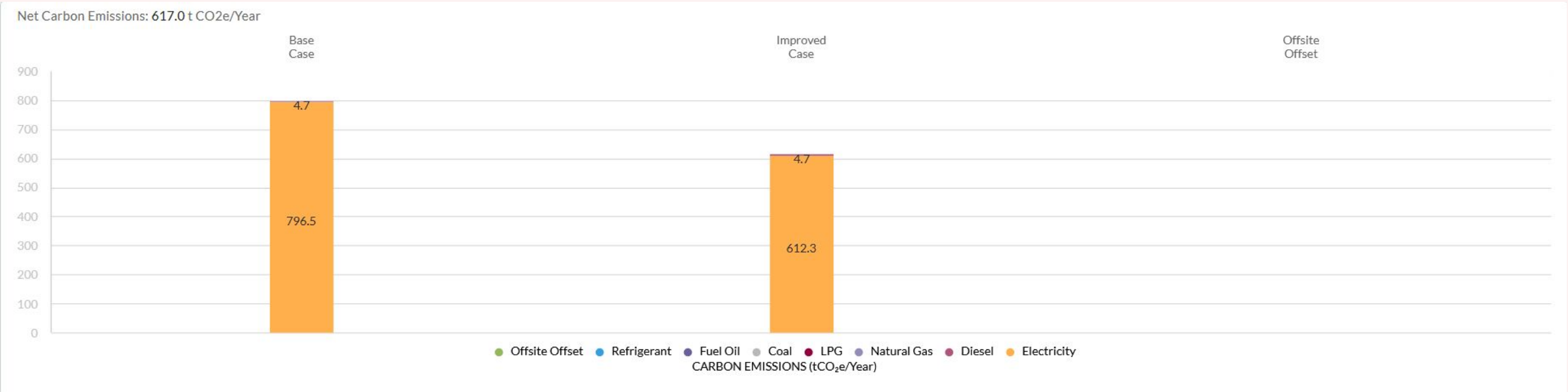
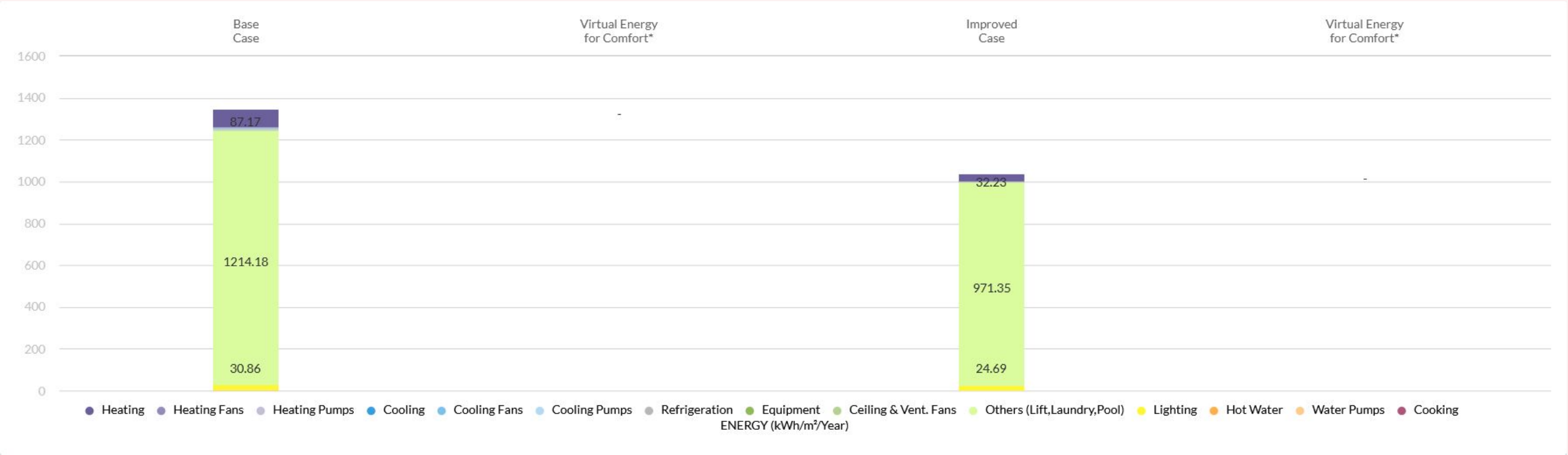
Building	Total Project Floor Area <i>m²</i>	Comsuption <i>Base Case</i>		Comsuption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Health Center	955	668131	700	401881	421	287,2	39,9%	98,6	34,7%



NEW SEMI-OLYMPIC SWIMMING POOL

Building	Floor Area <i>sqm</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Swimming pool	1300	945100	727	726404	559	219,2	23,1%	184,3	23,0%

Conventional EE insulation measures have only a marginal impact on this building's consumption. The majority of the building's energy demand comes from the swimming pool. To offset this demand and achieve 20% savings, it is necessary to install a renewable energy production source.



NEW SEMI-OLYMPIC SWIMMING POOL

Building	Floor Area <i>sqm</i>	Comsuption <i>Base Case</i>		Comsuption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Swimming pool	1300	945100	727	726404	559	219,2	23,1%	184,3	23,0%

Conventional EE insulation measures have only a marginal impact on this building's consumption. The majority of the building's energy demand comes from the swimming pool. To offset this demand and achieve 20% savings, it is necessary to install a renewable energy production source.

$$20\% \text{ de la consumption} = 145,281 \text{ kwh/year}$$

Estimated surface area needed to obtain 20% of consumption with mono-crystalline silicon solar panels:

In Prishtina, with annual solar irradiation average 1500 kWh/m² the area needed for 20% of the swimming pool's need is approximately **554 sqm equivalent to the 111kW peak power installed.**

Solar energy production is not consistent throughout the year (higher in summer, lower in winter). The defined 20% production represents the total production over the year in relation to annual requirements.

Energy supplied W [kWh/year] is given by the following general formula : **W = Esol . Pp . PR**

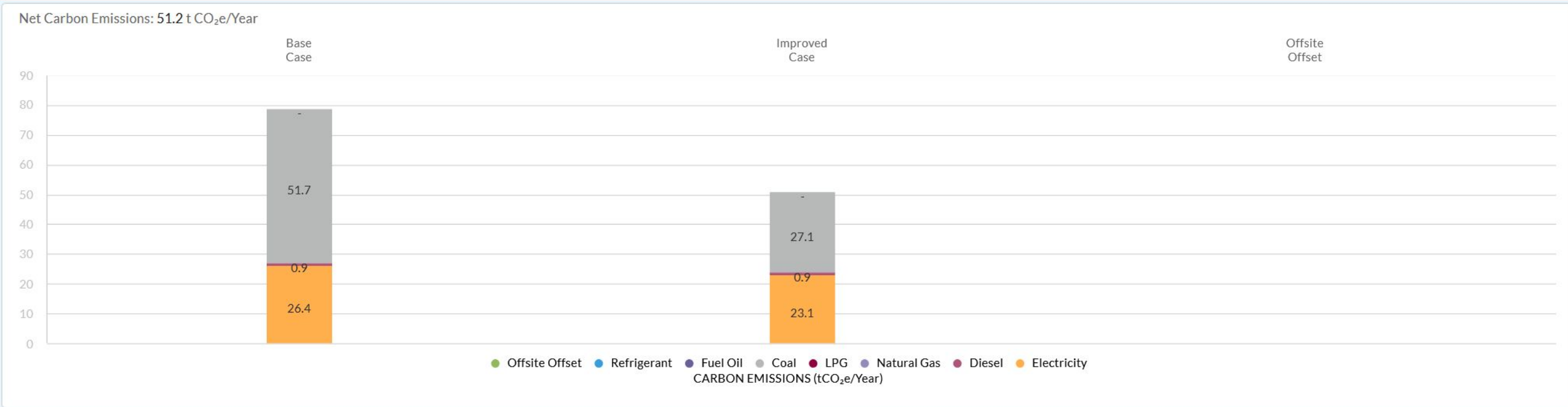
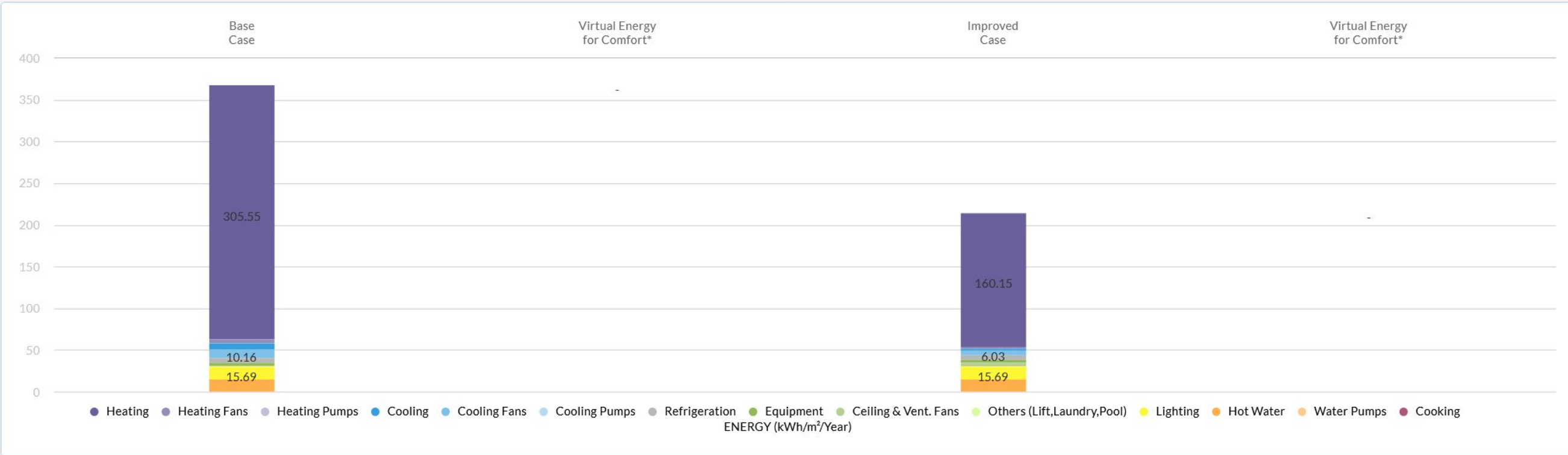
The various factors involved in this formula are as follows:

- . Esol [kWh/m² year] : annual solar irradiation,*
- . Pp [kW] : peak power,*
- . PR : Performance ratio*

Assumption: 1 panel of 1.05m x 1.85m as a peak power of 390W (0.39kW) and a performance ratio of 87%.

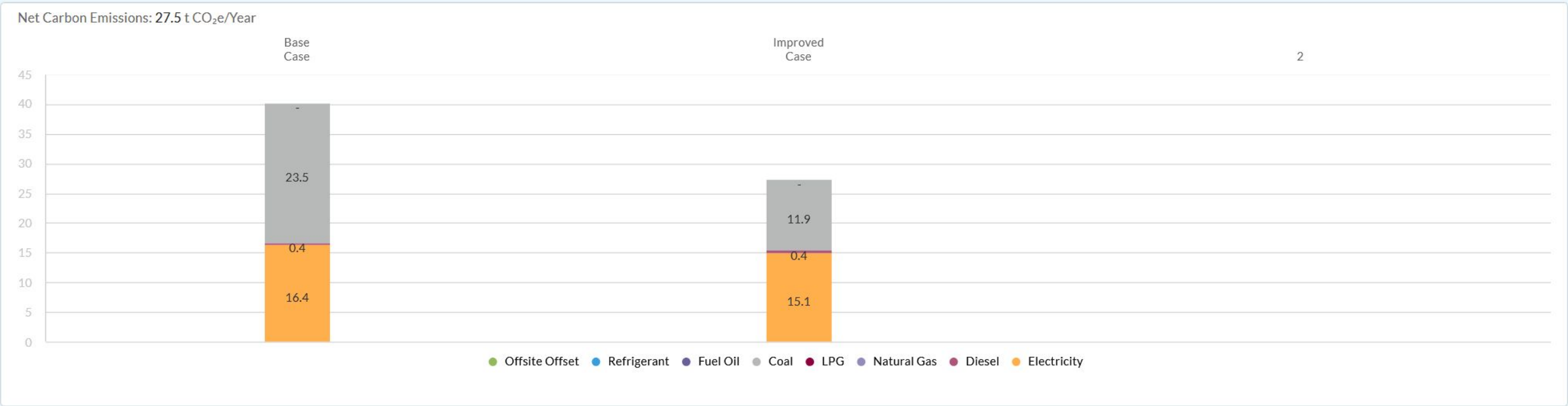
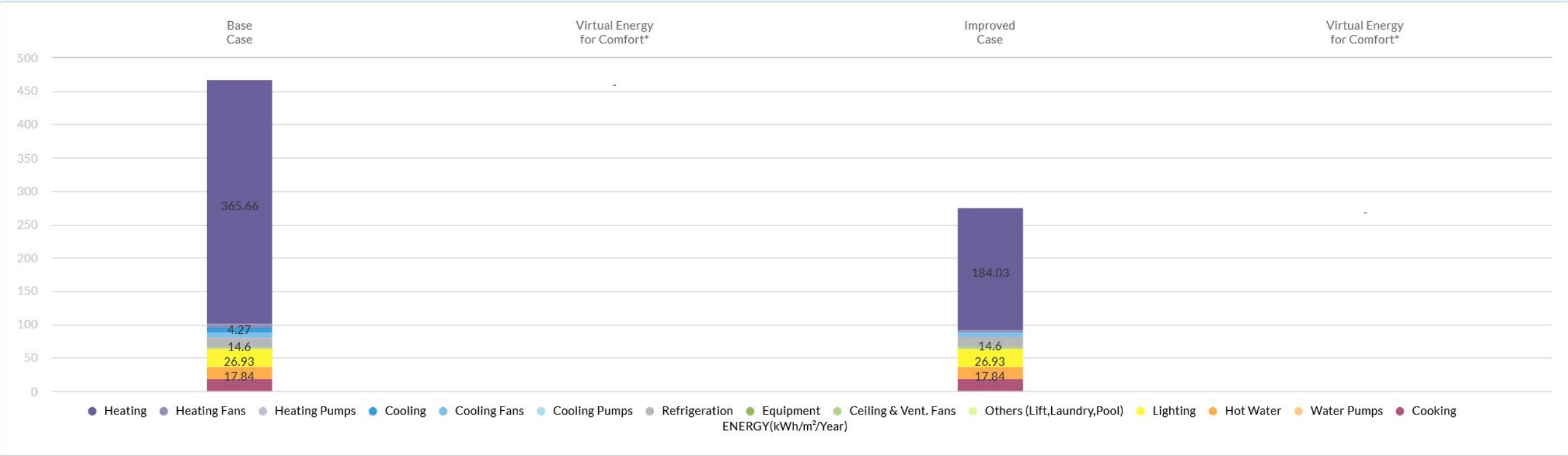
NEW MULTIPURPOSE HALL

Building	Total Project Floor Area <i>m²</i>	Comsuption <i>Base Case</i>		Comsuption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Multi Purpose Hall	450	193675	430	112661	250	81	41,8%	27,8	35,3%



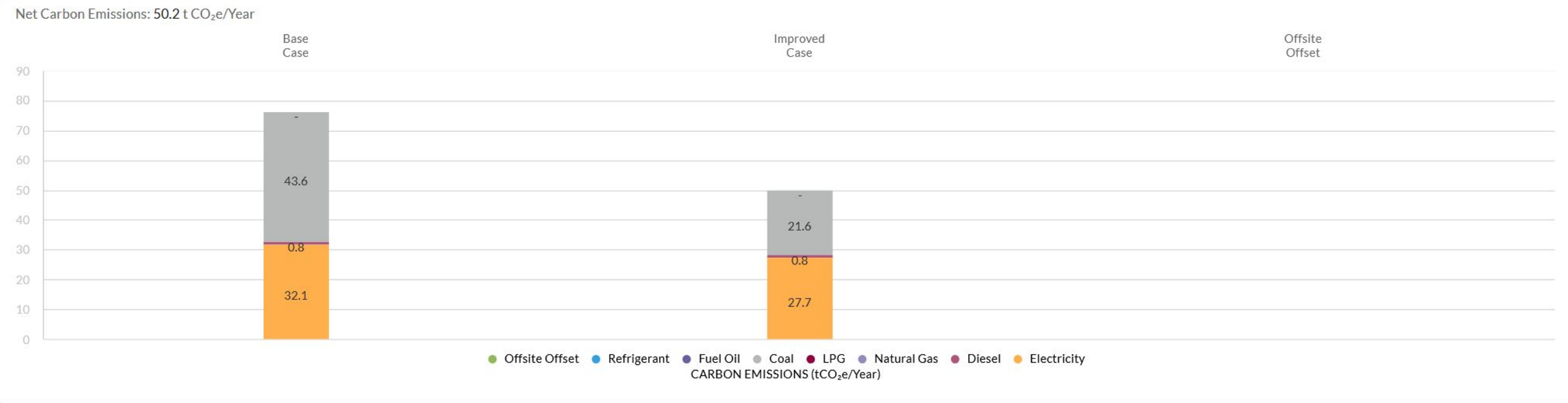
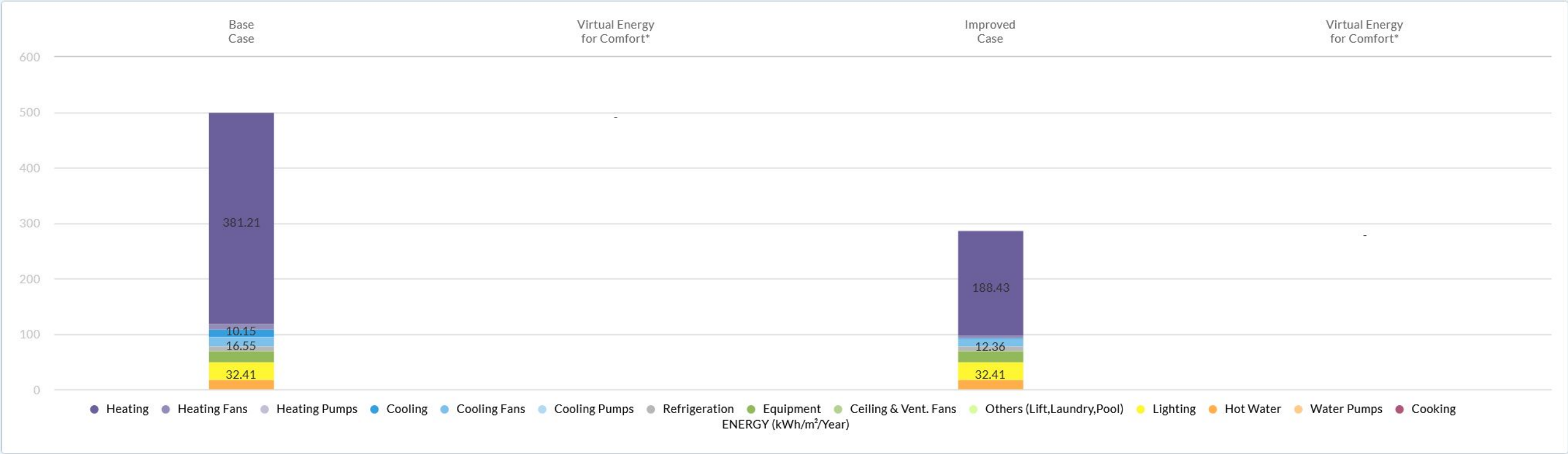
NEW CAFETERIA

Building	Total Project Floor Area <i>m²</i>	Comsuption <i>Base Case</i>		Comsuption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Cafeteria	160	93450	584	55257	345	38,2	40,9%	12,9	32,0%



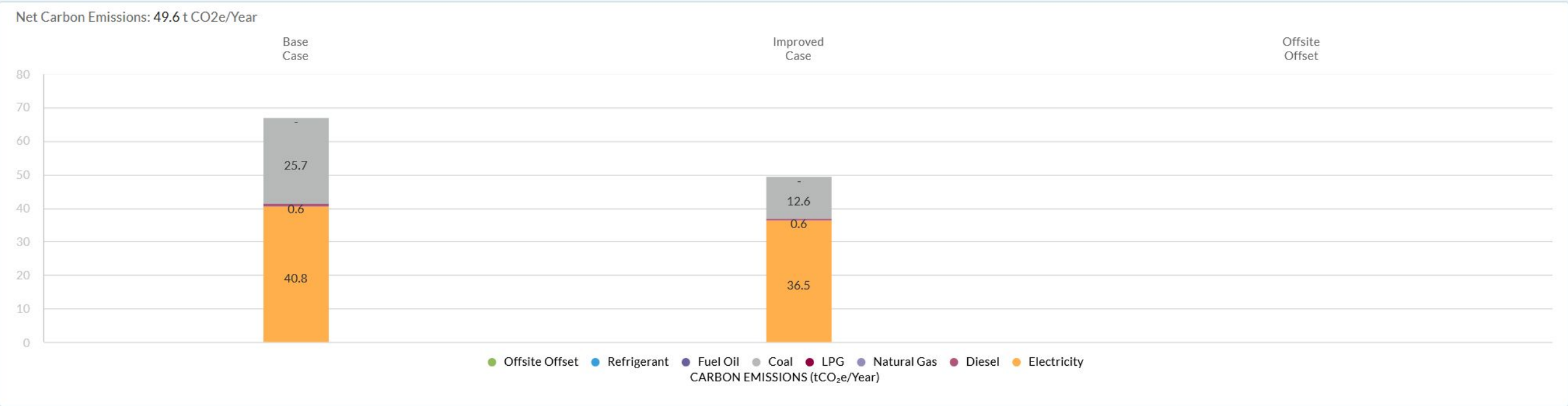
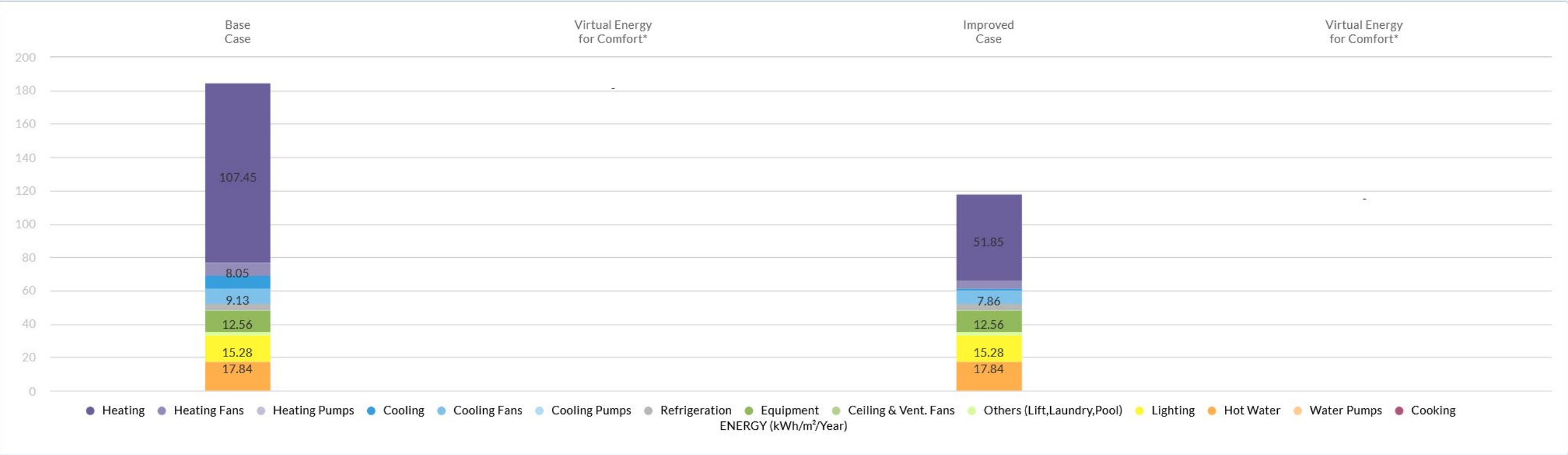
NEW LIBRARY

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
Library	315	175023	556	100866	320	74,2	42,4%	26,3	34,5%



NEW COMMERCIAL AREAS & CONFERENCE ROOMS

Building	Total Project Floor Area <i>m²</i>	Consumption <i>Base Case</i>		Consumption <i>Project</i>		Energy Savings		CO2 Savings	
		<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>kWh/Year</i>	<i>kWh/m²/Year</i>	<i>MWh/Year</i>	<i>%</i>	<i>tCO₂/Year</i>	<i>%</i>
commercial areas & conference rooms	570	129302	227	82805	145	46,5	36,0%	17,5	25,9%



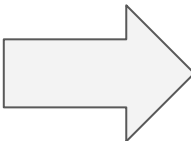
New construction : Water

Water consumption was estimated using efficiency metrics calculated with EDGE software.

The different water savings measures implemented in both the baseline scenario and the project scenario are summarized in the table below, covering the 10 buildings planned for construction.

With simple measures, 20% water savings is reach on the differents building.

Building	EE Measures EDGE on WATER					
	WEM01		WEM02		WEM04	
	Water-efficient Showerheads (L/min)		Water-efficient Faucets for all Bathrooms (L/min)		Efficient Water Closets for All Bathrooms: L/High volume flush and L/Low volume flush	
	Base	Project	Base	Project	Base	Project
New Dormitory 01	10	6	4	2	8 ; -	6 ; 3
New Dormitory 02	10	6	4	2	8 ; -	6 ; 3
New Dormitory 03	10	6	4	2	8 ; -	6 ; 3
Administration	-	-	4	2	8 ; -	6 ; 3
Health Center	10	6	4	2	8 ; -	6 ; 3
Swimming pool	10	6	4	2	8 ; -	6 ; 3
Multi Purpose Hall	-	-	4	2	8 ; -	6 ; 3
Cafeteria	-	-	4	2	8 ; -	6 ; 3
Library	-	-	4	2	8 ; -	6 ; 3
commercial areas & conference rooms	-	-	4	2	8 ; -	6 ; 3



Building	WATER	
	Final Water use	Saving
	m3/year	%
New Dormitory 01	17825	40,7%
New Dormitory 02	17135	40,7%
New Dormitory 03	35535	40,7%
Administration	116	33,1%
Health Center	713	38,0%
Swimming pool	504	28,6%
Multi Purpose Hall	567	30,4%
Cafeteria	309	25,9%
Library	523	30,6%
commercial areas & conference rooms	858	30,6%
TOTAL (m3/year)	74085	33,9%

STUDENT CENTER

SYNTHETIC TABLE OF EE MEASURES KWH and GHG IMPACTS and COST SAVINGS FOR THE STUDENT CENTER

Building type	Building name	Year of construction	Net area	Theoretical FINAL energy consumption		Final energy consumption Savings			GHG emissions Savings		Savings on invoices	
				Before	After							
			m²	kWh/year/m²	kWh/year/m²	kWh/year/m²	kWh/year	%	T eq CO2/year	%	€ /year	%
Student Center	Konvikti 1	1965	4 385	336,3	244,3	-92,0	-403 542	-27,4%	-151,4	-28,6%	-52 932 €	-34,6%
	Konvikti 2	1971	2 855	305,8	290,9	-14,9	-42 527	-4,9%	-25,6	-5,9%	-8 942 €	-8,4%
	Konvikti 3	1963	3 647	320,6	268,8	-51,8	-189 093	-16,2%	-101,0	-15,8%	-35 574 €	-20,6%
	Konvikti 4	1967	2 888	297,0	274,7	-22,3	-64 535	-7,5%	-30,4	-7,2%	-17 628 €	-15,8%
	Konvikti 5	1980	5 777	235,3	237,4	2,1	12 294	0,9%	-2,7	-0,4%	-12 305 €	-6,1%
	Konvikti 6	2007	3 519	213,5	223,0	9,5	33 464	4,5%	28,1	5,6%	-3 984 €	-2,5%
	Konvikti 7	2007	3 407	223,7	227,5	3,8	12 856	1,7%	14,7	3,0%	-6 690 €	-4,4%
	Konvikti 8	2014	3 085	199,6	201,4	1,8	5 596	0,9%	8,7	2,2%	-5 675 €	-4,5%
	Sum	-	29 564	-	-	-	-635 487	-	-259,5	-	-143 729 €	-
	Average	-	3 695	266,5	246,0	-20,5	-79 436	-6,0%	-32,4	-5,9%	-17 966 €	-12,1%
	Restaurant	1974	1 417	107,6	71,3	-36,3	-51 351	-33,7%	-77,5	-34,7%	-29 514 €	-37,9%
New Constructions	Tetori Sport hall	1975	1 987	110,9	78,8	-32,1	-63 729	-28,9%	-49,8	-29,8%	-13 715 €	-34,5%
	Sum	-	3 404	-	-	-	-115 081	-	-127,3	-	-43 230 €	-
	Average	-	1 702	109,2	75,1	-34,2	-57 540	-31,3%	-63,7	-32,3%	-21 615 €	-36,2%
	New Dormitory 01	-	5 417	175,0	124,0	-51,0	-276 267	-29,1%	-102,7	-18,8%	-	-
	New Dormitory 02	-	4 532	184,0	130,0	-54,0	-244 728	-29,3%	-92,2	-19,3%	-	-
	New Dormitory 03	-	8 324	156,0	113,0	-43,0	-357 932	-27,6%	-134,4	-17,6%	-	-
	Administration	-	410	344,0	217,0	-127,0	-52 070	-36,9%	-19,9	-28,6%	-	-
	Health Center	-	955	700,0	421,0	-279,0	-266 445	-39,9%	-98,6	-34,7%	-	-
	Swimming pool	-	1 300	727,0	524,0	-203,0	-263 900	-27,9%	-222,6	-27,8%	-	-
	Multi Purpose Hall	-	450	430,0	250,0	-180,0	-81 000	-41,9%	-17,5	-35,3%	-	-
	Cafeteria	-	160	584,0	345,0	-239,0	-38 240	-40,9%	-12,9	-32,0%	-	-
	Library	-	315	556,0	320,0	-236,0	-74 340	-42,4%	-26,3	-34,5%	-	-
	Commercial areas & Conference rooms	-	570	227,0	145,0	-82,0	-46 740	-36,1%	-17,5	-25,9%	-	-
	Sum	-	22 433	-	-	-	-1 701 662	-	-744,6	-	-	-
	Average	-	2 243	408,3	258,9	-149,4	-170 166	-35,2%	-74,5	-27,5%	-	-

A large, dark blue triangle pointing to the right, occupying the left half of the slide.

6

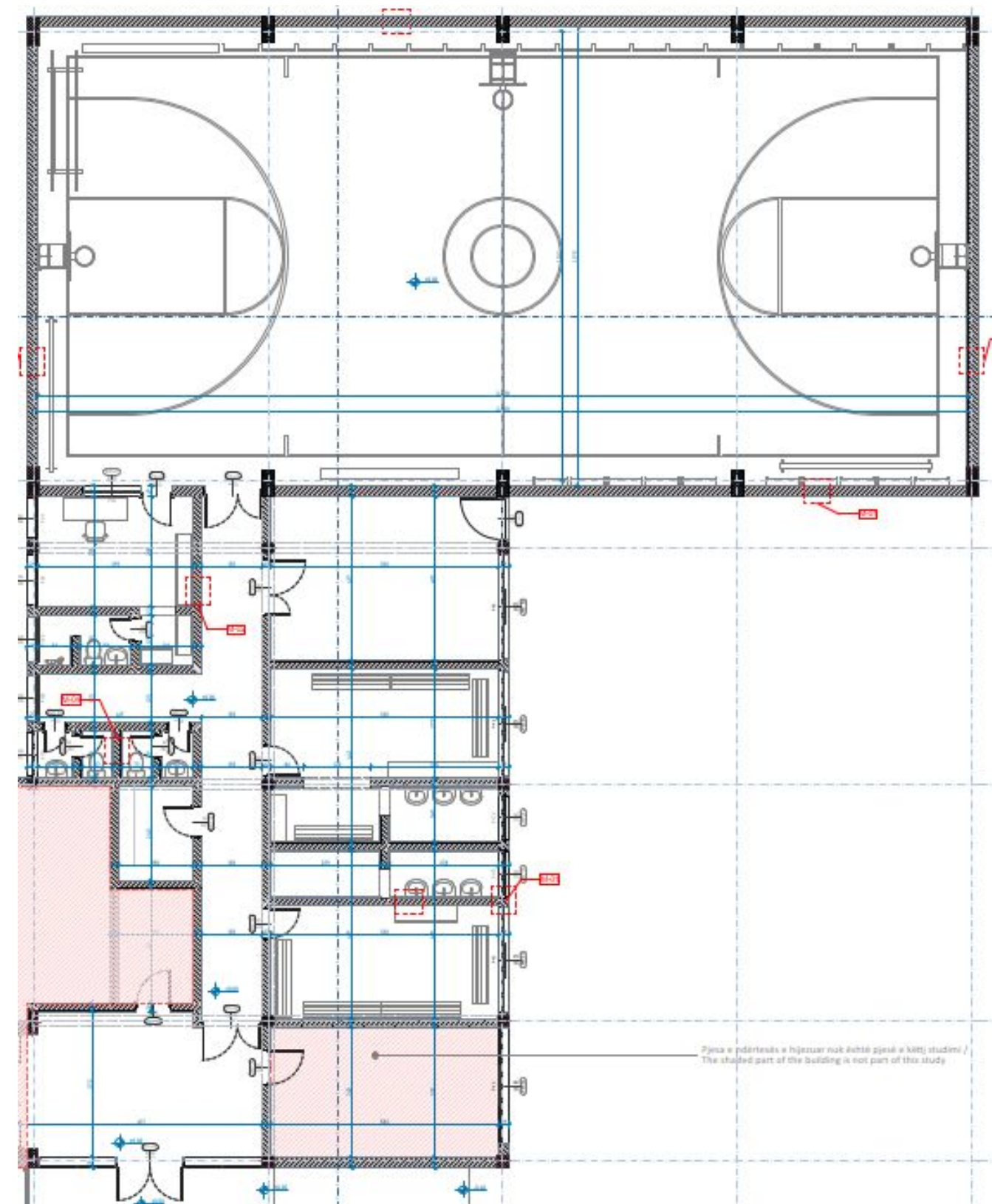
TRAINING VENUES

Technical assessment, Audit Results & EE measures

TRAINING VENUES

Elena Gjika
Emin Duraku
Faik Konica
Hasan Prishtina
Iliria
Ismail Qemali
Nazim Gafurri
Pavaresia
Shkolla e Gjelber
Qamil Batalli
Xhemail Mustafa
FEFS sports hall

ELENA GJIKA - Building Characteristics	
General characteristics	
Dormitory/ies concerned	ELENA GJIKA
Year of construction	1927
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	402 sqm
Estimated occupancy Capacity	1 670 students in the school For calul :1 person for 10 sqm: 40 persons



The opposite table presents with the following information for the **Elena Gjika’s Training venue** :

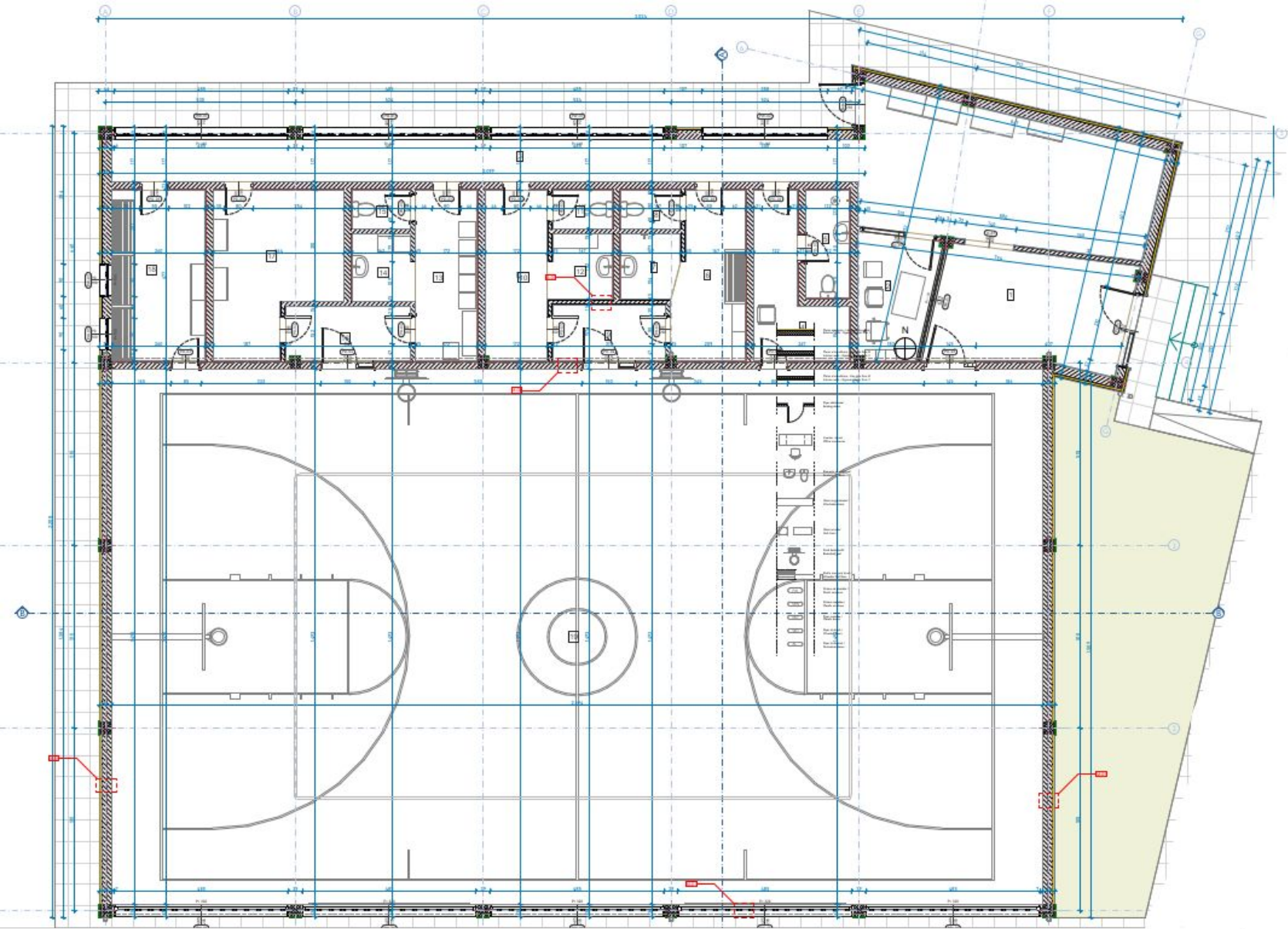
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Elena Gjika](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Elena GJIKA	Rr.Emin Duraku no.7, Prishtina	1927	379,34	Gas Oil
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	44091,6	116,2	12,7	6 566,94 €
After EE measures	13313,4	35,1	4,4	2 190,11 €
Savings	-30778,2	-81,1	-8,3	-4 376,83 €
	-69,81%		-65,35%	-66,65%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 10cm		19 060,40 €
	Roofs	Installing thermal insulation on the roof slab, minimum 8cm XPS		18 070,00 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		48 240,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		46 369,50 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes Replace the existing old steel ribbed radiators, Add thermostatic radiator valves (TRVs)		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		-
TOTAL				€ 131 739,90
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

EMIN DURAKU - Building Characteristics	
General characteristics	
Dormitory/ies concerned	EMIN DURAKU
Year of construction	2012
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	554 sqm
Estimated occupancy Capacity	510 students in the school For calul :1 person for 10 sqm: 55 persons



FASADA JUG-PERENDIMORE / SOUTH-WEST ELEVATION



FASADA VERI-LINDORE / NORTH-EAST ELEVATION



FASADA JUG-LINDORE / SOUTH-EAST ELEVATION



FASADA JUG-LINDORE / SOUTH-EAST ELEVATION



FASADA JUG-LINDORE / SOUTH-EAST ELEVATION

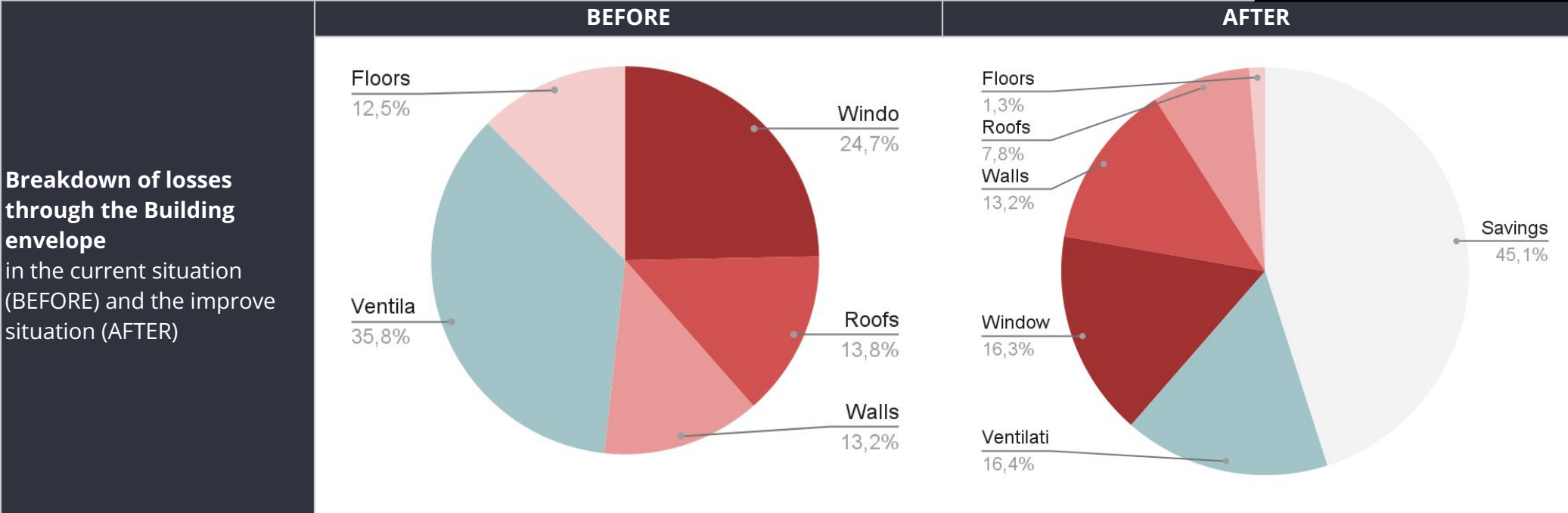
The opposite table presents with the following information for the **Emin Duraku’s Training venue** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

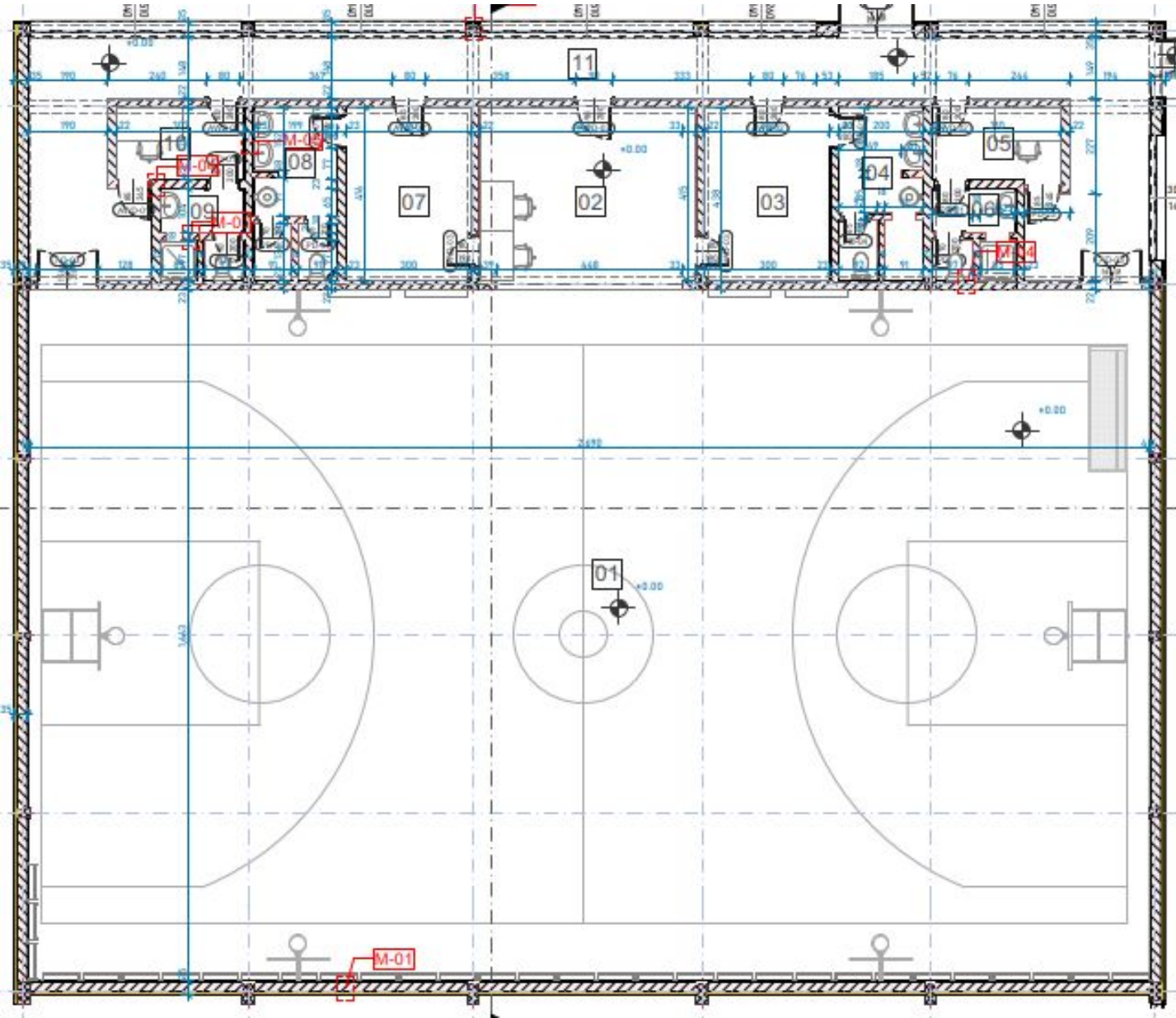
The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Emin Duraku](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Emin Duraku	Maliq Pashë Gjinolli, Prishtina	2013	554,26	Gas Oil
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	39462,2	71,2	11,8	6 025,66 €
After EE measures	18763,5	33,9	6,2	3 100,70 €
Savings	-20698,6	-37,3	-5,5	-2 924,96 €
	-52,45%		-46,99%	-48,54%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	-		-
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		36 810,15 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		66 511,20 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		48 311,00 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Replace the existing old steel ribbed radiators with modern, Apply thermal insulation to the heating pipes. Add thermostatic radiator valves (TRVs)		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary	Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators			-
TOTAL				€ 151 632,35



FAIK KONICA - Building Characteristics	
General characteristics	
Dormitory/ies concerned	FAIK KONICA
Year of construction	1968
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	592 sqm
Estimated occupancy Capacity	597 students in the school For calul :1 person for 10 sqm: 59 persons



The opposite table presents with the following information for the **Faik Konica’s Training venue** :

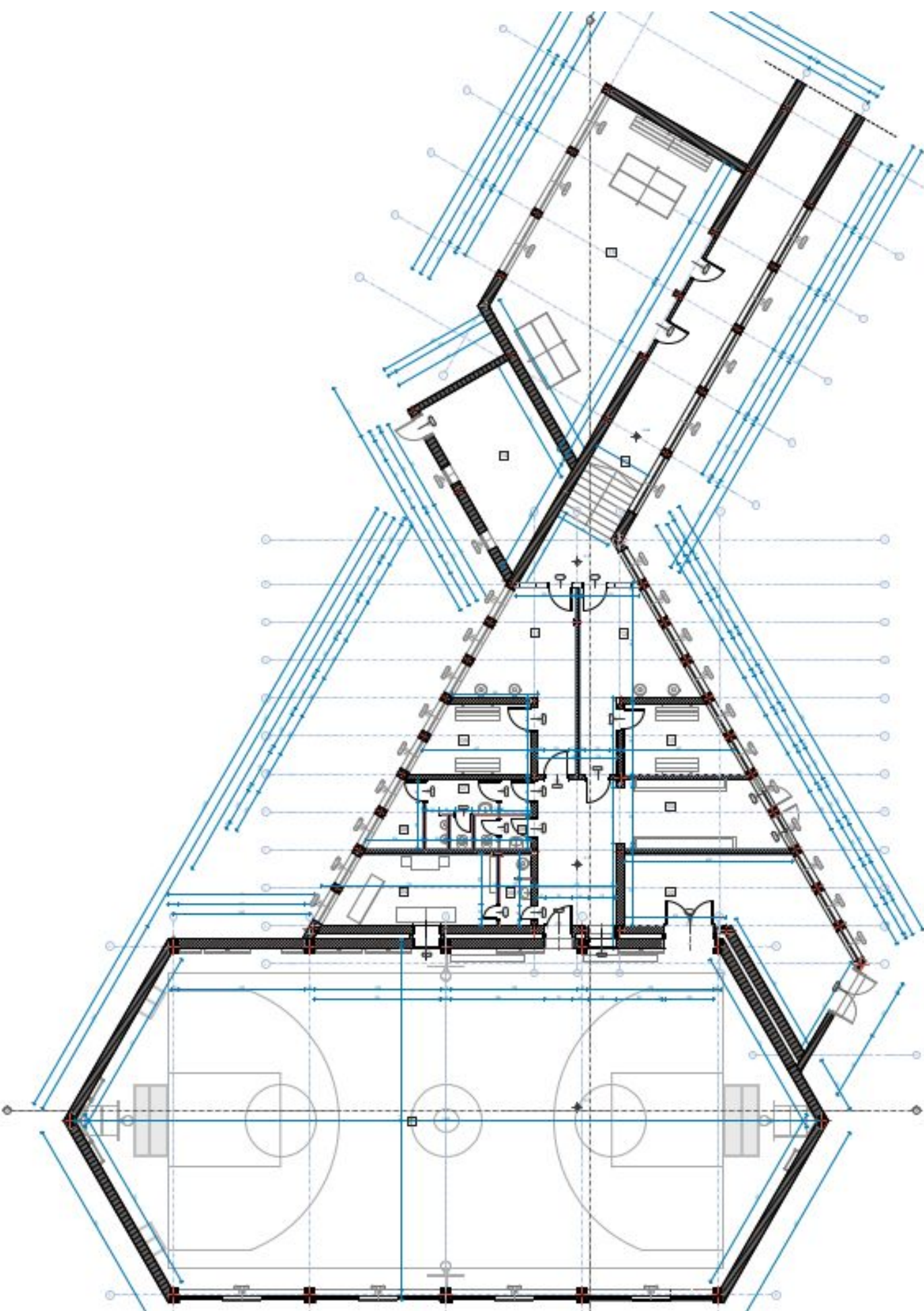
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Faik Konica](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Faik Konica	Rr.Xhorxh Bush no.60, Prishtina	1968	591,93	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	46885,1	79,2	17,2	3 198,90 €
After EE measures	23981,0	40,5	9,2	2 159,28 €
Savings	-22904,1	-38,7	-8,0	-1 039,62 €
	-48,85%		-46,75%	-32,50%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls			
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		39 211,90 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		71 031,60 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		31 768,00 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes.		
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		
TOTAL				€ 142 011,50
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

HASAN PRISHTINA - Building Characteristics	
General characteristics	
Dormitory/ies concerned	HASAN PRISHTINA
Year of construction	1968
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	710 sqm
Estimated occupancy Capacity	2 260 students in the school For calul :1 person for 10 sqm: 71 persons



The opposite table presents with the following information for the **Hasan Pristina’s Training venue** :

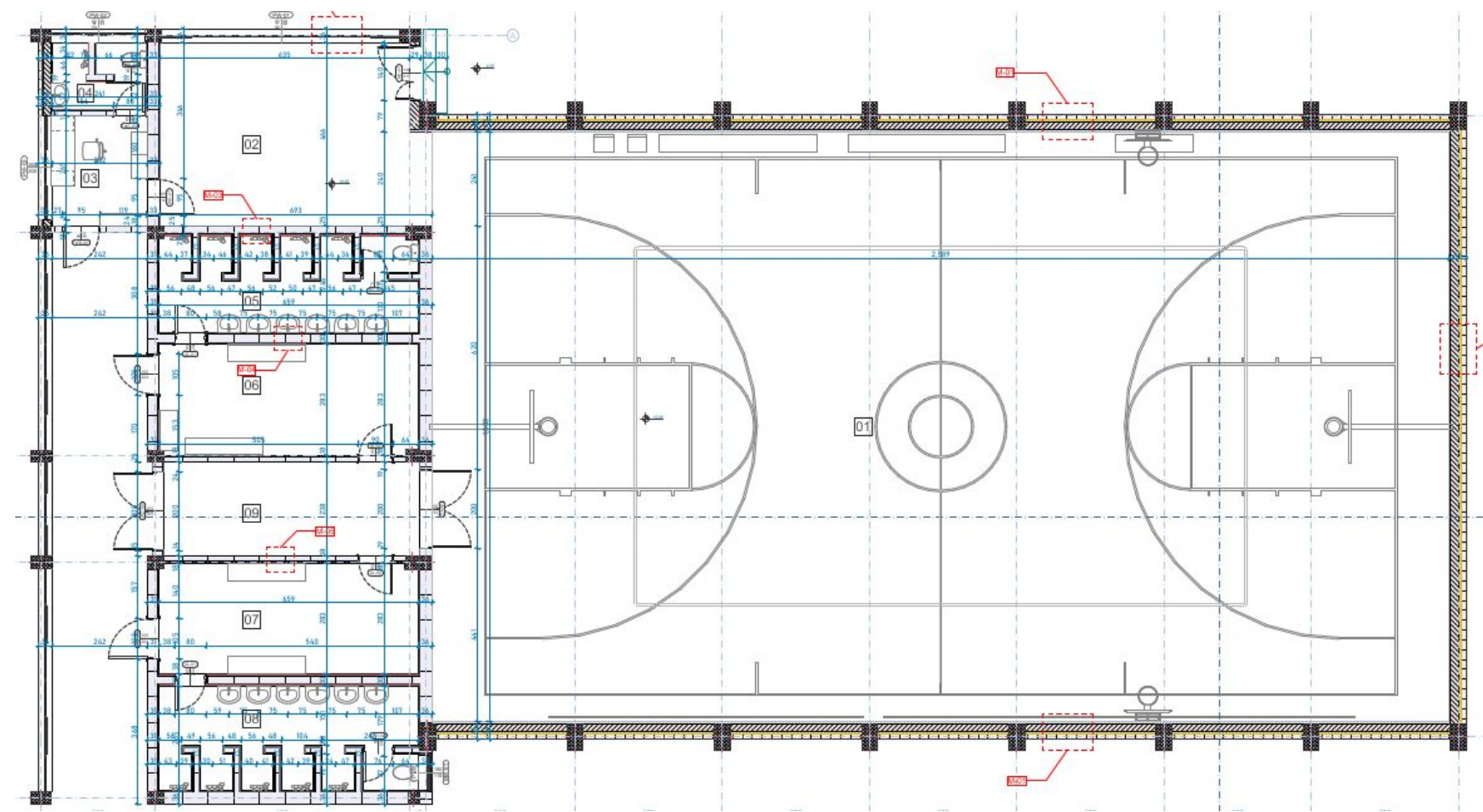
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Hasan Prishtina](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Hasan Pristina	Rr.Ulpiana, Prishtina	1968	709,64	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	110797,7	156,1	40,4	7 213,31 €
After EE measures	21120,1	29,8	8,3	2 215,59 €
Savings	-89677,6	-126,4	-32,1	-4 997,72 €
	-80,94%		-79,50%	-69,28%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 10cm		36 552,40 €
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		37 481,60 €
	Floors	Installing thermal insulation on the floor slab, minimum 12cm XPS		85 156,80 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		53 349,50 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Replace the existing old steel ribbed radiators with modern, Apply thermal insulation to the heating pipes.		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary	Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators			-
TOTAL				€ 212 540,30
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

ILIRIA - Building Characteristics	
General characteristics	
Dormitory/ies concerned	ILIRIA
Year of construction	Unknown
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	514 sqm
Estimated occupancy Capacity	1 559 students in the school For calul :1 person for 10 sqm: 51 persons



The opposite table presents with the following information for the **Iliria’s Training venue** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Iliria](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Iliria	Rr.Isa Kastrati, Prishtina	?	514,01	Gas Oil
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	44701,1	87,0	13,1	6 747,05 €
After EE measures	16508,0	32,1	5,7	2 804,51 €
Savings	-28193,2	-54,8	-7,4	-3 942,55 €
	-63,07%		-56,56%	-58,43%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	-		
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		37 974,95 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		61 680,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		59 761,00 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes.		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary		Restoring showers and sinks		-
TOTAL				€ 159 415,95
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

ISMAIL QEMALI - Building Characteristics	
General characteristics	
Dormitory/ies concerned	ISMAIL QEMALI
Year of construction	1981
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	738 sqm
Estimated occupancy Capacity	3 000 students in the school For calul :1 person for 10 sqm: 74 persons



The opposite table presents with the following information for the **Ismail Qemali’s Training venue** :

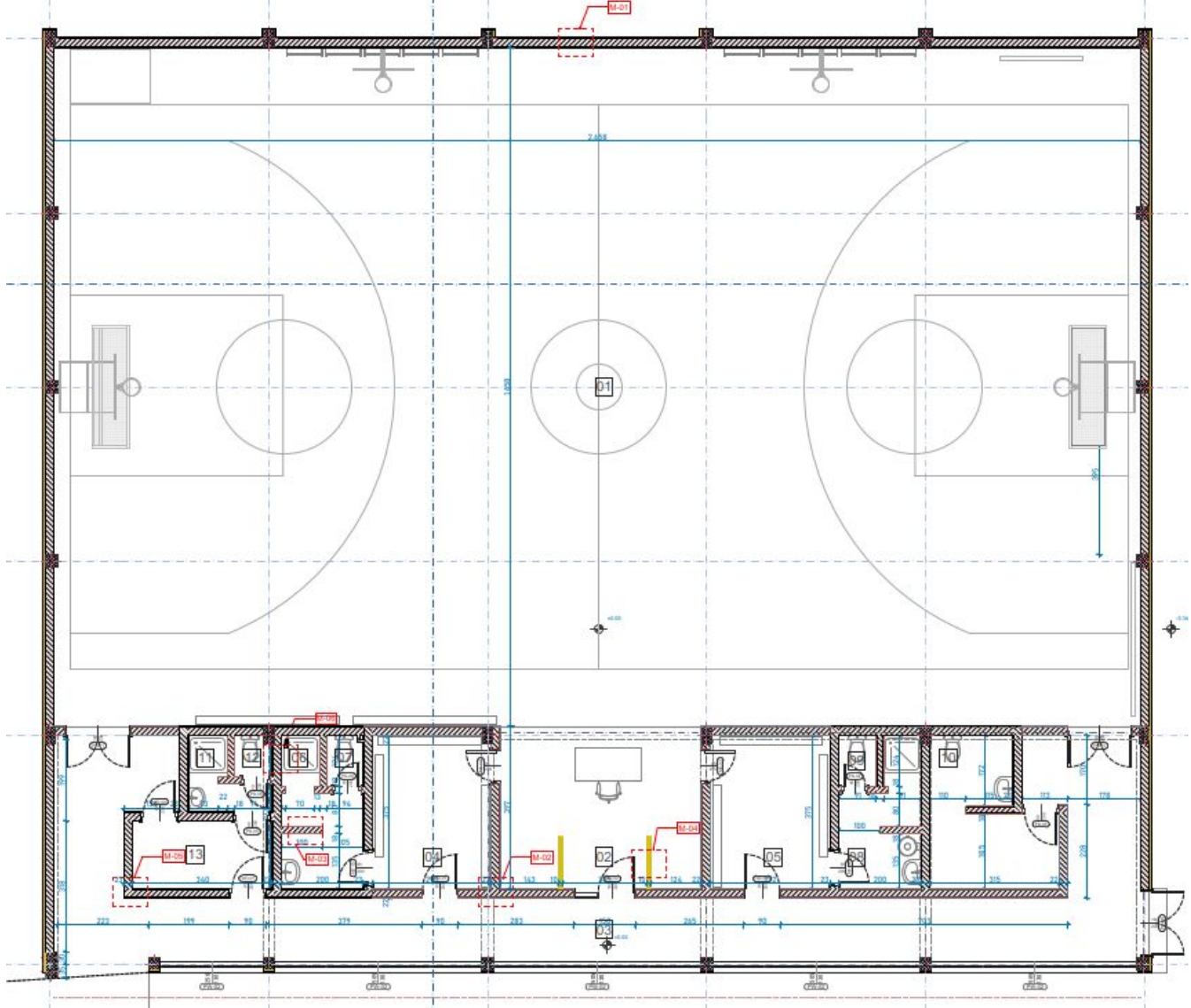
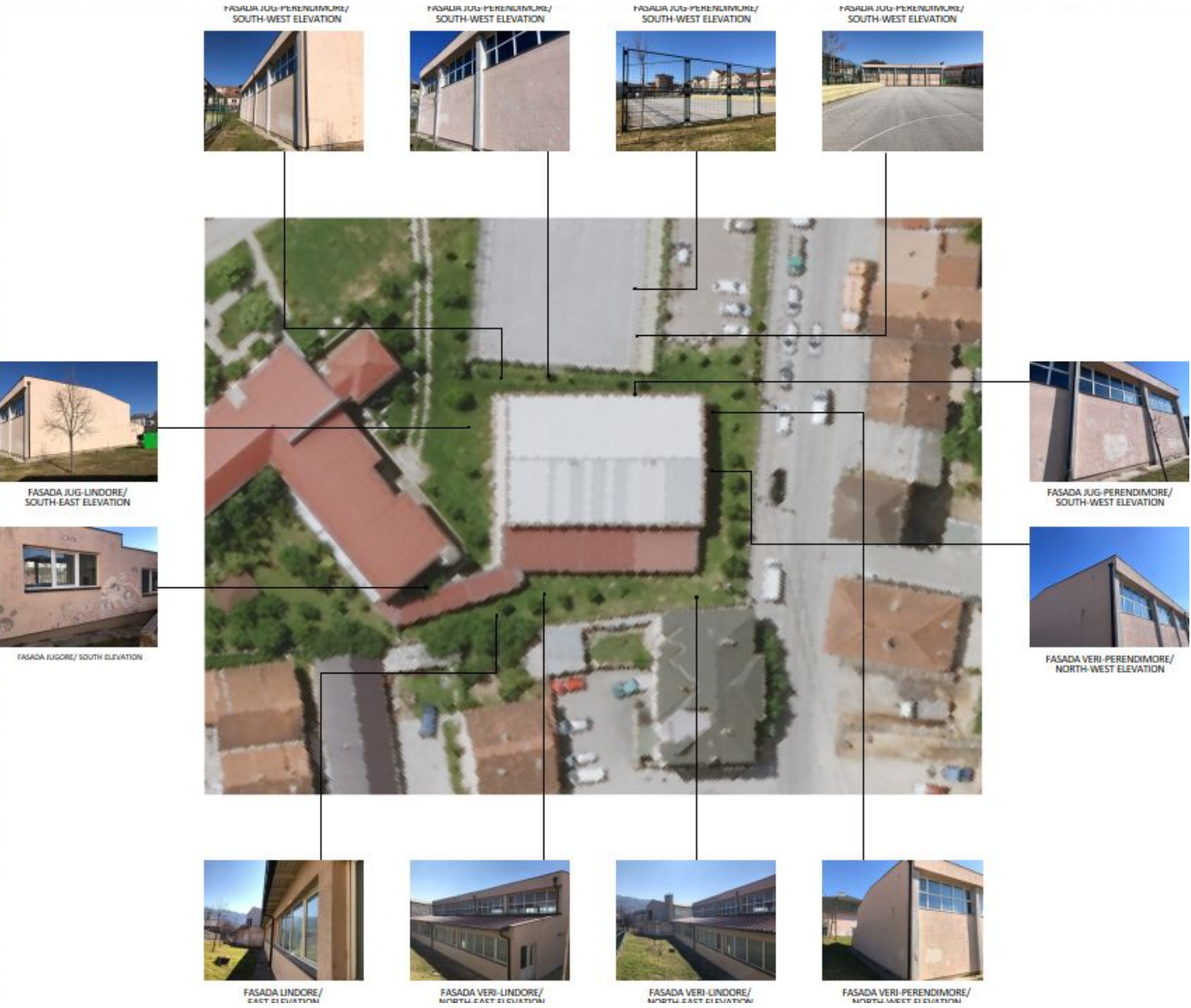
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures
- Return on investment calculated for each EE measures, as well as for the total set of measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Ismail Qemali](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Ismail Qemali	Rr.Enver Maloku ,Kodra e Dielit 1, Prishtina	1981	691,75	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	151131,6	218,5	54,1	8 362,67 €
After EE measures	22947,2	33,2	9,1	2 482,15 €
Savings	-128184,4	-185,3	-45,1	-5 880,53 €
	-84,82%		-83,27%	-70,32%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 8.0cm		25 288,00 €
	Roofs	Installing thermal insulation on the roof slab, minimum 12cm XPS		48 750,00 €
	Floors	Installing thermal insulation on the floor lab, minimum 10cm XPS		88 500,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		90 375,50 €
Systems	Heating	Replace the existing old steel ribbed radiators with modern, Apply thermal insulation to the heating pipes, Add thermostatic radiator valves (TRVs)		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		
TOTAL				€ 252 913,50
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

NAZIM GAFURRI - Building Characteristics	
General characteristics	
Dormitory/ies concerned	NAZIM GAFURRI
Year of construction	2013
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	574 sqm
Estimated occupancy Capacity	597 students in the school For calul :1 person for 10 sqm: 57 persons



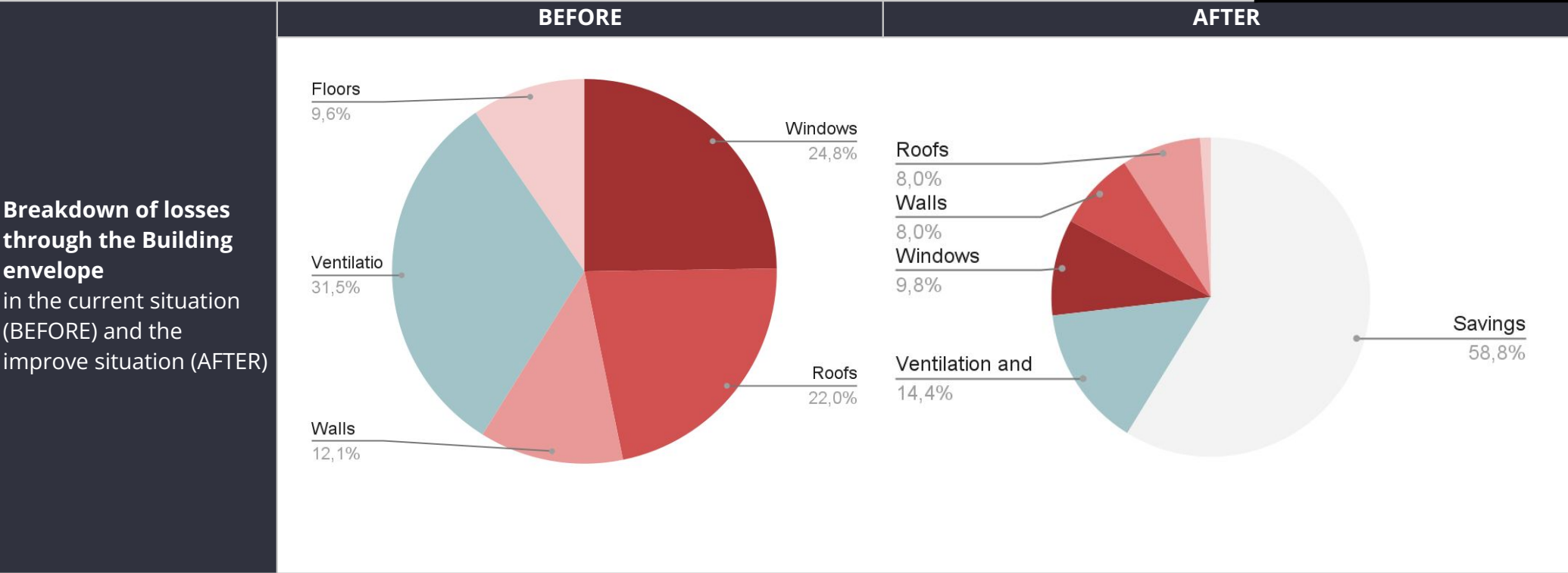
The opposite table presents with the following information for the **Nazim Gafurri’s Training venue** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

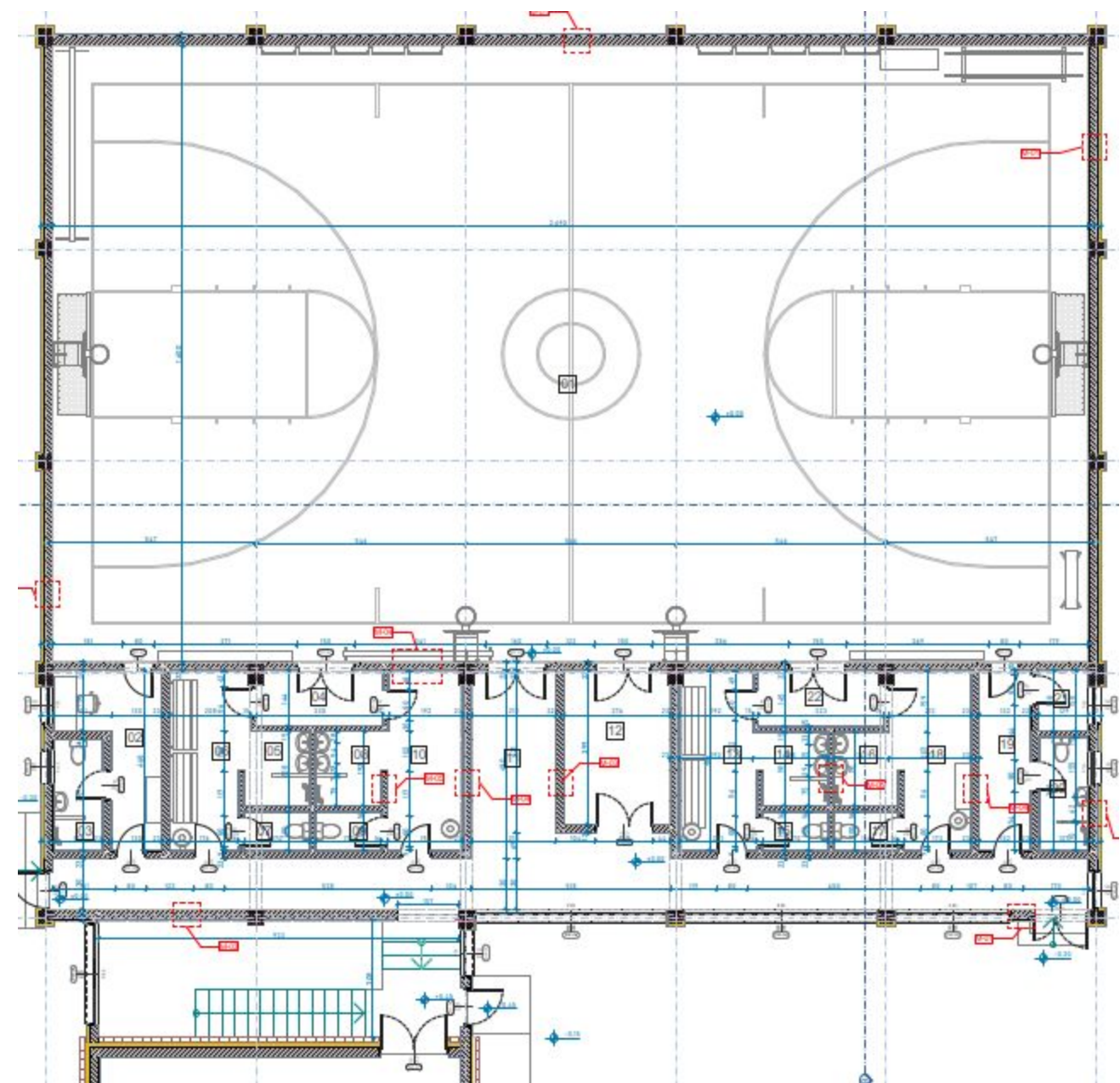
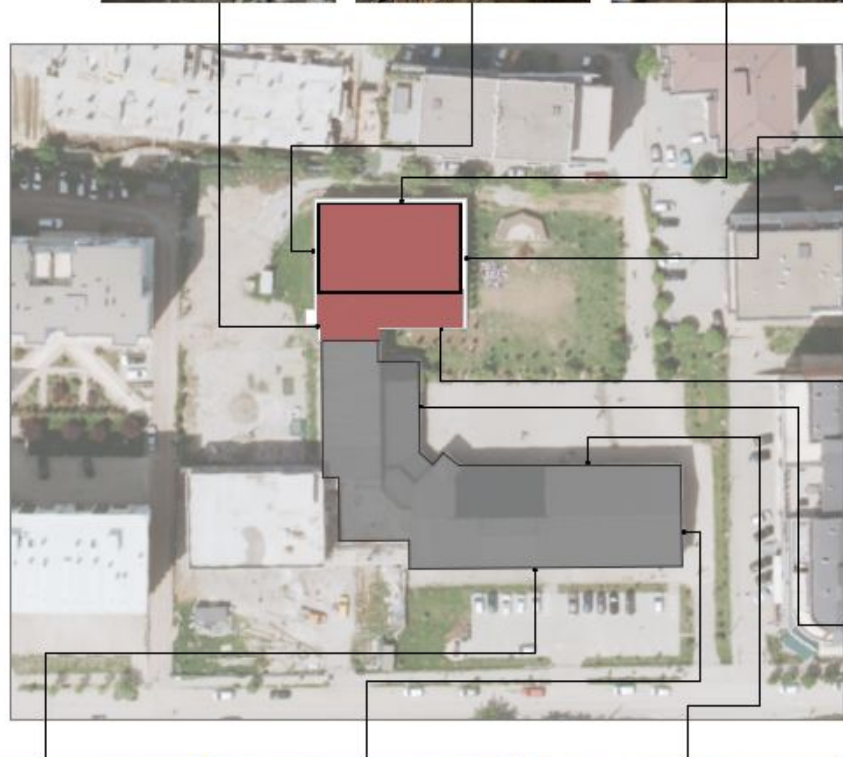
The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Nazim Gafurri](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Nazim Gafurri	Rr.Bajram Bahtiri, Prishtina	2013	573,94	Gas Oil
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	46461,8	81,0	13,7	7 040,19 €
After EE measures	16066,5	28,0	5,6	2 730,22 €
Savings	-30395,2	-53,0	-8,2	-4 309,97 €
	-65,42%		-59,53%	-61,22%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm		19 466,80 €
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		38 285,00 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		68 880,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		47 822,00 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes. Replace the existing old steel ribbed radiators with modern. Add thermostatic radiator valves (TRVs)		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictors or aerators		-
TOTAL				€ 174 453,80



PAVARESIA- Building Characteristics	
General characteristics	
Dormitory/ies concerned	PAVARESIA
Year of construction	2016
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	540 sqm
Estimated occupancy Capacity	1 900 students in the school For calul :1 person for 10 sqm: 54 persons



The opposite table presents with the following information for the **Pavaresia’s Training venue** :

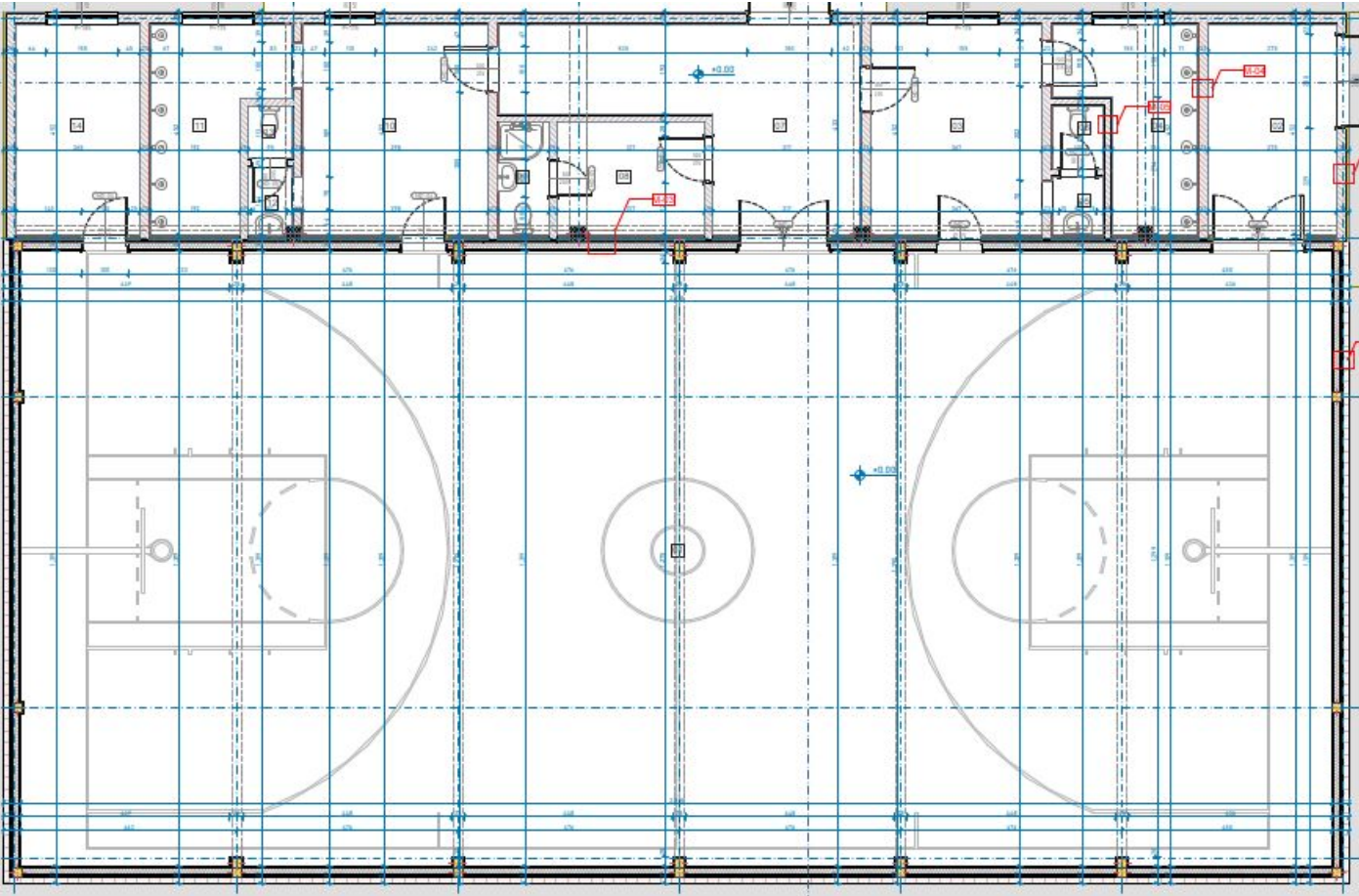
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Pavaresia](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Pavarësia	Rr.Astrit Rrushit,Lagjja e Spitalit, Prishtina	2016	539,76	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	51117,8	94,7	18,6	3 318,48 €
After EE measures	19724,9	36,5	7,6	1 889,26 €
Savings	-31392,9	-58,2	-11,0	-1 429,22 €
	-61,41%		-59,15%	-43,07%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm		19 840,00 €
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		40 784,25 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		64 800,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		48 410,50 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes. Replace the existing old steel ribbed radiators with modern Add thermostatic radiator valves (TRVs)		
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary		Restoring showers and sinks		
TOTAL				€ 173 834,75
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

SHKOLLA GJELBER - Building Characteristics	
General characteristics	
Dormitory/ies concerned	GJELBER, GREEN SCHOOL
Year of construction	2011
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	492 sqm
Estimated occupancy Capacity	412 students in the school For calul :1 person for 10 sqm: 41 persons



The opposite table presents with the following information for the **Shkolla e Gjëlber's Training venue** :

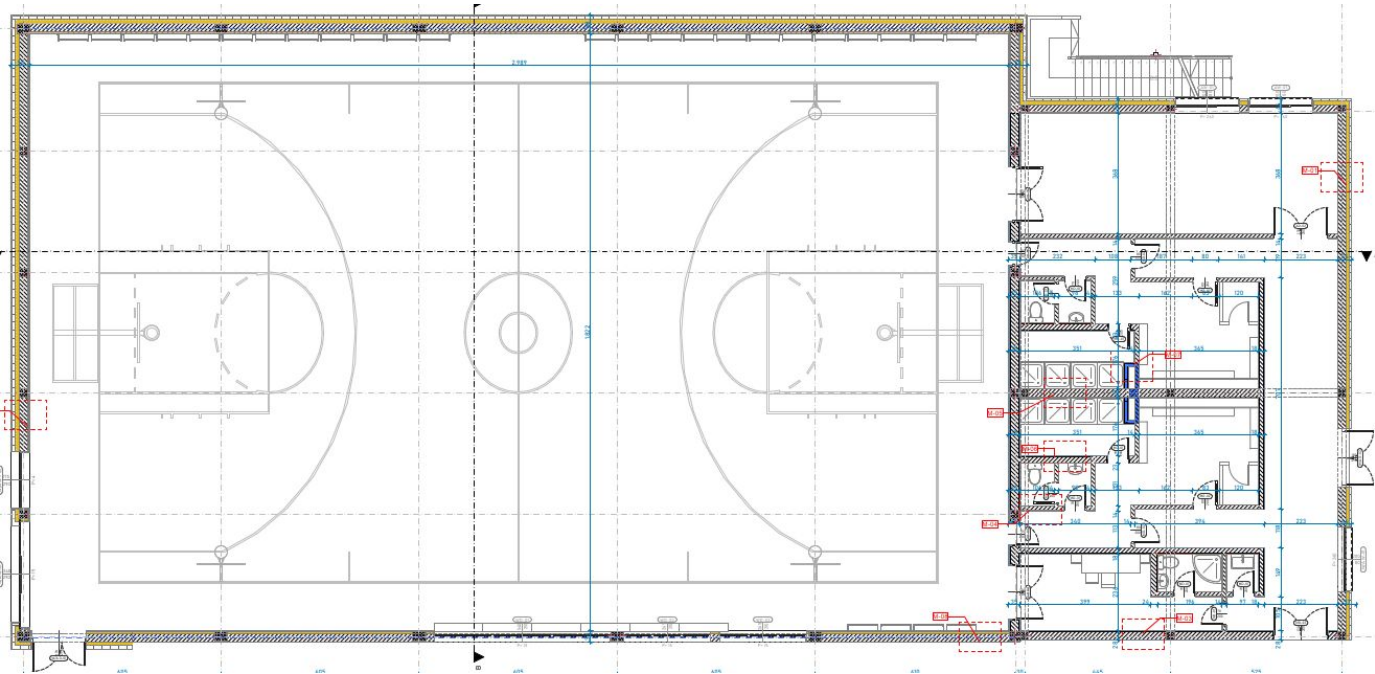
- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Green School](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Shkolla e Gjelber	Rr.Çameria, Prishtina	2011	491,84	Heat pump
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	12896,6	26,2	6,0	2 771,48 €
After EE measures	12439,9	25,3	5,8	2 673,34 €
Savings	-456,7	-0,9	-0,2	-98,14 €
	-3,54%		-3,54%	-3,54%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls			
	Roofs	Renovation of the roof is needed to restore impermeability		
	Floors			
	Windows			
Systems	Heating			
	Ventilation	Verify the current fresh air flow rates and system balancing, Clean and maintain air filters, ducts, and diffusers regularly, Consider integrating CO ₂ or occupancy sensors		
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		
TOTAL				€ ,00
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

QAMIL BATALLI - Building Characteristics	
General characteristics	
Dormitory/ies concerned	QAMIL BATALLI
Year of construction	2016
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	450 sqm
Estimated occupancy Capacity	800 students in the school For calul :1 person for 10 sqm: 45 persons



The opposite table presents with the following information for the **Qamil Batalli's Training venue** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

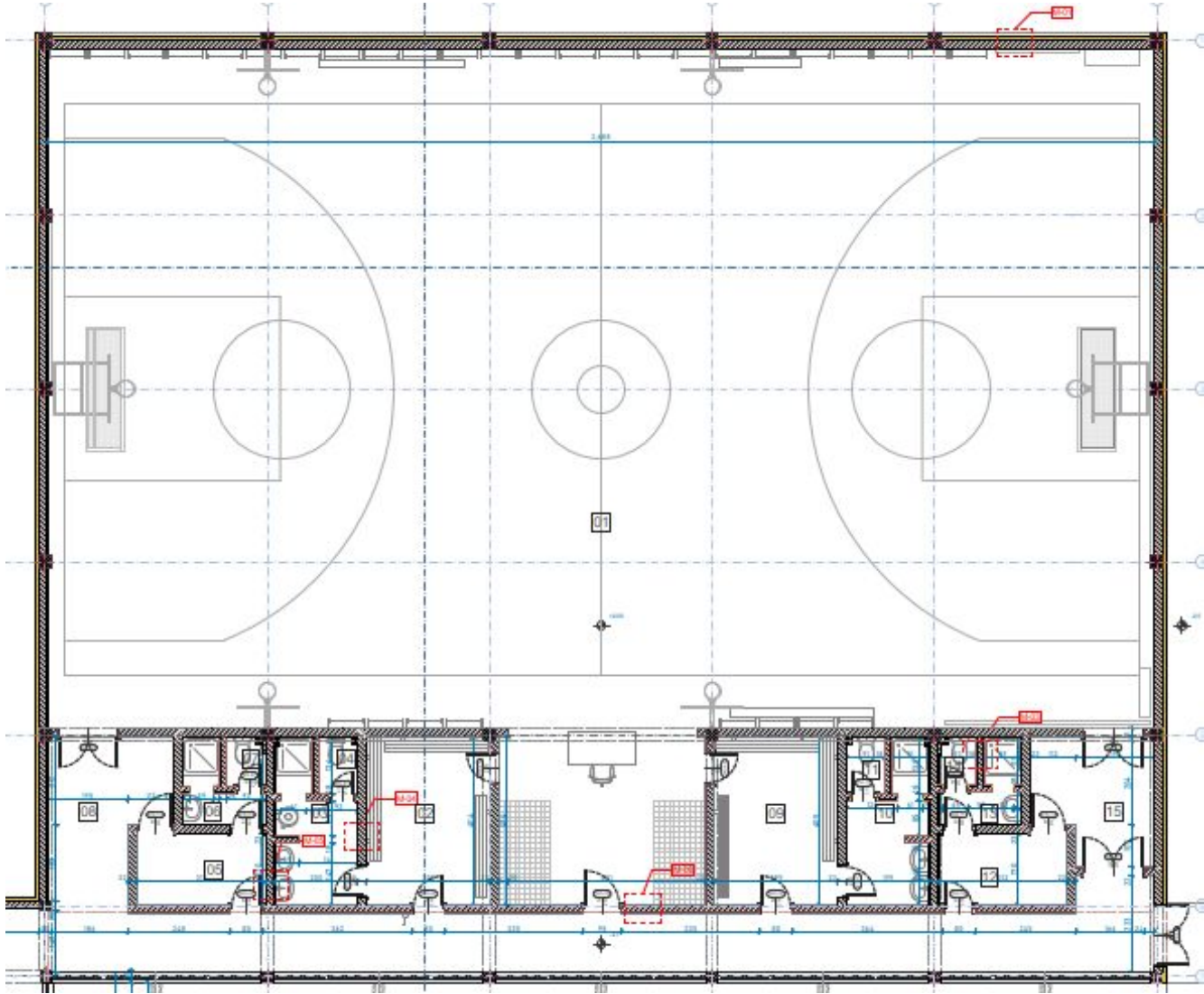
The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Qamil Batalli](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Qamil Batalli	Rr.Sami Plakolli/Zagrebi no.141, Prishtina	2013	649,45	Gas Oil
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	22972,3	35,4	7,6	3 777,24 €
After EE measures	22972,3	35,4	7,6	3 777,24 €
Savings	0,0	0,0	0,0	0,00 €
	0,00%		0,00%	0,00%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls			
	Roofs			
	Floors			
	Windows			
Systems	Heating			
	Ventilation			
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		
TOTAL				€ ,00
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

XHEMAIL MUSTAFA - Building Characteristics

General characteristics	
Dormitory/ies concerned	XHEMAIL MUSTAFA
Year of construction	2004
Number of Levels	1 Storey-building
Total Net Area of the Physical Education Hall	616 sqm
Estimated occupancy Capacity	1 132 students in the school For calul :1 person for 10 sqm: 62 persons



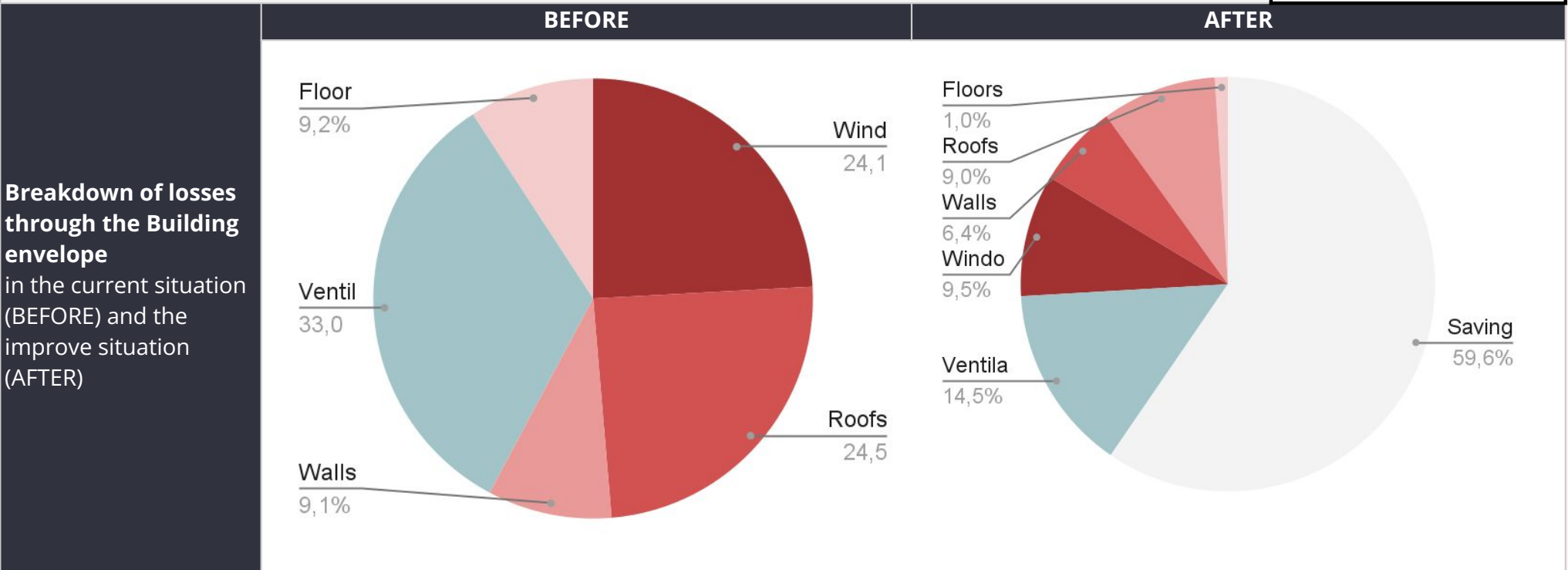
The opposite table presents with the following information for the **Xhemail Mustafa's Training venue** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

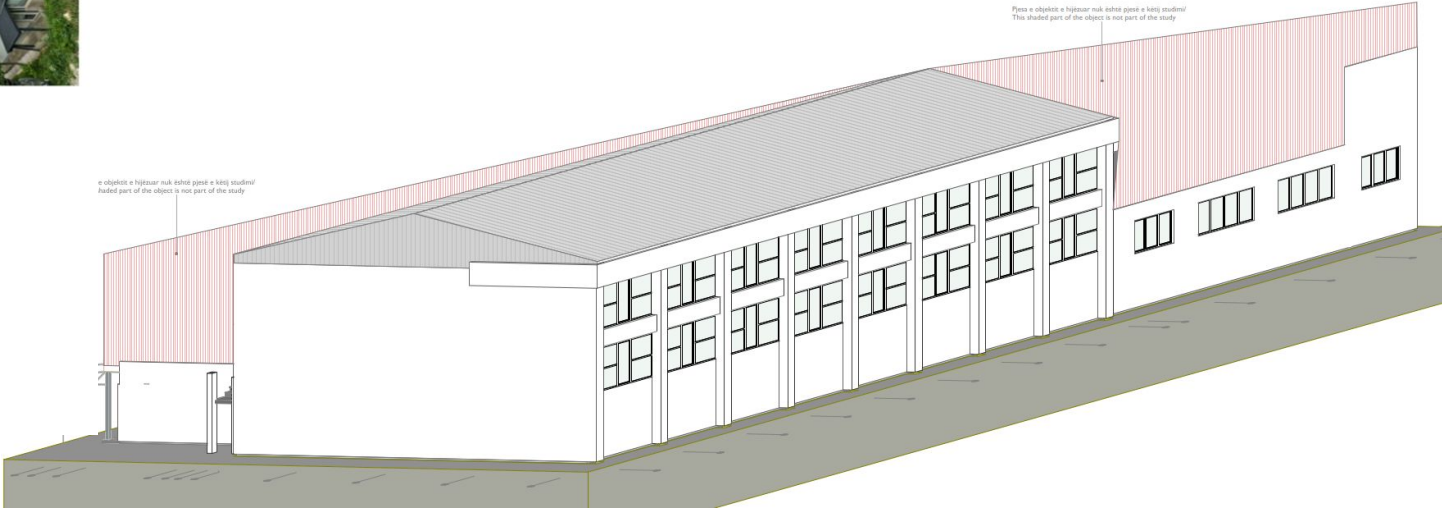
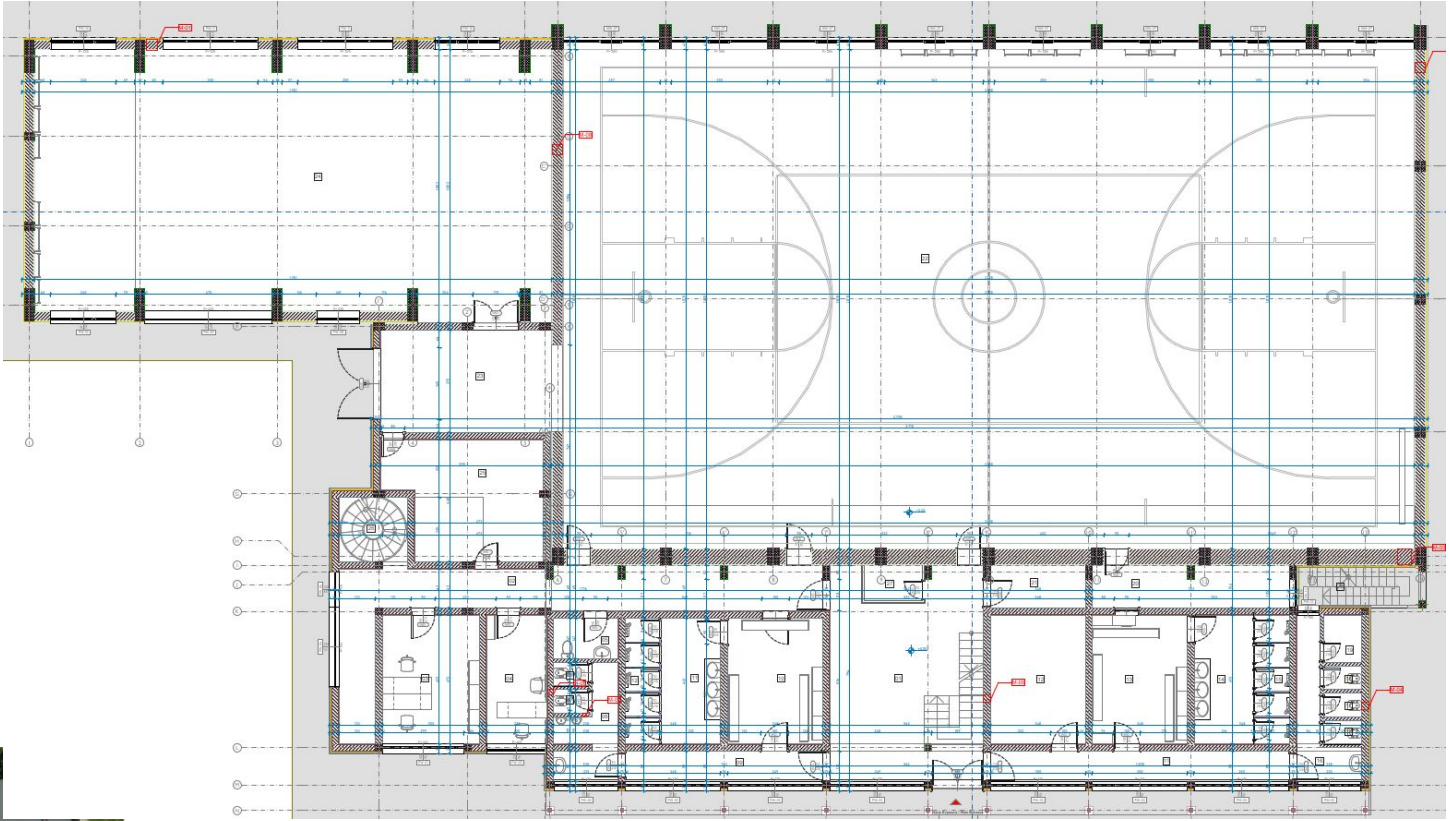
The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Energy audit Xhemail Mustafa](#) for more details on the General Condition of the building and on Energy Efficiency measures.

General data				
Schools' name	Address	Year of construction	Total covered area	Type of energy consumed for heating
Xhemail Mustafa	Rr.Sadik Bekteshi no.44, Prishtina	2004	617,33	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	60300,7	97,7	22,0	3 883,55 €
After EE measures	20704,9	33,5	8,1	2 085,31 €
Savings	-39595,8	-64,1	-13,9	-1 798,24 €
	-65,66%		-63,30%	-46,30%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls	Adding additional layer of thermal insulation minimum thickness 5cm		28 320,00 €
	Roofs	Installing thermal insulation on the roof slab, minimum 10cm XPS		44 333,25 €
	Floors	Installing thermal insulation on the floor slab, minimum 10cm XPS		73 886,40 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		56 414,50 €
Systems	Heating	Apply thermal insulation to the heating pipes, Add thermostatic radiator valves (TRVs)		-
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery		-
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		-
Sanitary		Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictores or aerators		-
TOTAL				€ 202 954,15



FEFS SPORTS HALL - Building Characteristics	
General characteristics	
Year of construction	1975
Number of Levels	1 Storey-building
Total Net Area	1066
Heated area	870
Estimated occupancy Capacity	402 students is the university For calul :1 person for 10 sqm: 87 persons



The opposite table presents with the following information for the **FEFS Sports Hall** :

- Energy consumption before and after EE measures
- GHG emissions before and after EE measures
- Associated costs
- Description and costing of energy efficiency measures

The table is based on the energy audit results provided by Assemblage Ingénierie, which are more detailed than those of the local consultant, whose assessments followed the Kosovar methodology for walkthrough energy audits (see §2 Methodology).

Refer to the [Walkthrough Audit FEFS Sports Hall](#) for more details on the General condition of the building and on Energy Efficiency measures.

General data				
Building's name		Year of construction	Total covered area	Type of energy consumed for heating
FEFS Sports Hall		1975	870	District heating power plant - COAL
Consumption, Emissions, Cost				
	Consumption (Final Energy)		GHG Emissions	Cost
	kWh/year	kWh/year/m²	T eq CO2/year	€ / year
Before EE measures	80783,8	75,8	30,8	7 142,89 €
After EE measures	41883,3	39,3	16,7	4 755,17 €
Savings	-38900,5	-36,5	-14,1	-2 387,72 €
	-48,15%		-45,79%	-33,43%
Energy efficiency measures				
EE Measures				Cost
Envelope	Walls			
	Roofs	Installing thermal insulation on the floor lab, minimum 10cm XPS		37 225,50 €
	Floors	Installing thermal insulation on the roof lab, minimum 10cm mineral wool		127 884,00 €
	Windows	Replacing all windows, PVC, Aluminum and steel with new triple-glazing PVC windows (U=1,1W/m².K) with opening sections for natural ventilation.		64 330,00 €
Systems	Heating	Replace the existing wall-mounted hot air blowers with modern, Apply thermal insulation to the heating pipes.		
	Ventilation	Install a double-flow mechanical ventilation system equipped with heat recovery Integrate CO2 sensors, control and monitoring		
	Lighting	Install ceiling-mounted linear or panel LED Integrate daylight and motion sensors to optimize energy use		
Sanitary	Restoring showers and sinks Replace existing taps with sensor-activated or self-closing taps equipped with flow restrictors or aerators			
TOTAL				€ 229 439,50
Breakdown of losses through the Building envelope in the current situation (BEFORE) and the improve situation (AFTER)	BEFORE		AFTER	

TRAINING VENUES

SYNTHETIC TABLE OF EE MEASURES KWH and GHG IMPACTS and COST SAVINGS FOR THE STUDENT CENTER

Building type	Building name	Year of construction	Net area	Theoretical FINAL energy consumption		Final energy consumption Savings			GHG emissions Savings		Savings on invoices	
				Before	After							
			m²	kWh/year/m²	kWh/year/m²	kWh/year/m²	kWh/year	%	T eq CO2/year	%	€ /year	%
Training venues	FEFS Sport Hall	1975	870	75,8	39,3	-36,5	-31757,0	-48,2%	-14,1	-45,8%	-2 387,72 €	-33,4%
	Elena Gjika	1927	379	116,2	35,1	-81,1	-30778,2	-69,8%	-8,3	-65,4%	-4 376,83 €	-66,6%
	Emin Duraku	2013	554	71,2	33,9	-37,3	-20698,6	-52,5%	-5,5	-47,0%	-2 924,96 €	-48,5%
	Faik Konica	1968	592	79,2	40,5	-38,7	-22904,1	-48,9%	-8,0	-46,7%	-1 039,62 €	-32,5%
	Hasan Pristina	1968	710	156,1	29,8	-126,4	-89677,6	-80,9%	-32,1	-79,5%	-4 997,72 €	-69,3%
	Iliria	?	514	87,0	32,1	-54,8	-28193,2	-63,1%	-7,4	-56,6%	-3 942,55 €	-58,4%
	Ismail Qemali	1981	692	218,5	33,2	-185,3	-128184,4	-84,8%	-45,1	-83,3%	-5 880,53 €	-70,3%
	Nazim Gafurri	2013	574	81,0	28,0	-53,0	-30395,2	-65,4%	-8,2	-59,5%	-4 309,97 €	-61,2%
	Pavarësia	2016	540	94,7	36,5	-58,2	-31392,9	-61,4%	-11,0	-59,2%	-1 429,22 €	-43,1%
	Gjelber	2011	492	26,2	25,3	-0,9	-456,7	-3,5%	-0,2	-3,5%	-98,14 €	-3,5%
	Qamil Batalli	2013	649	35,4	35,4	0,0	0,0	0,0%	0,0	0,0%	0,00 €	0,0%
	Xhemail Mustafa	2004	617	97,7	33,5	-64,1	-39595,8	-65,7%	-13,9	-63,3%	-1 798,24 €	-46,3%
	Don Bosko	2014										
Sum		-	6313	-	-	-	-422276,8	-	-139,8	-	-30 797,78 €	-
Average		-	574	96,6	33,0	-63,6	-38388,8	-54,2%	-12,7	-51,3%	-2799,8	-45,4%